

SOUTHERN POWER AND INDUSTRY

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SEPTEMBER, 1953

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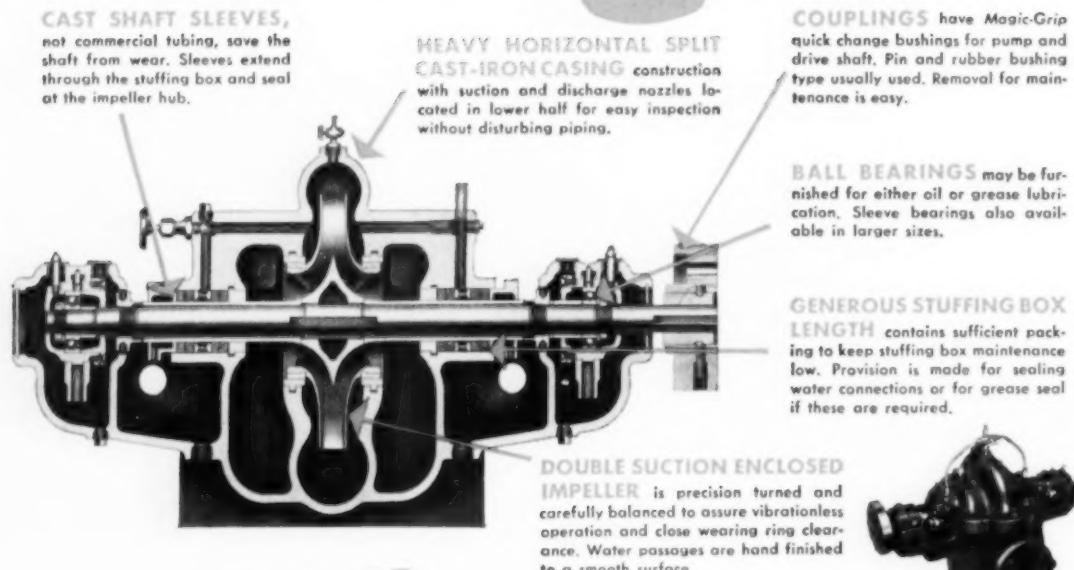
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Volume 71

Number 9

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CONTINUITY
LOWER MAINTENANCE—
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WROUGHT IRON
TUBULAR AND HOT ROLLED PRODUCTS

ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

SOUTHERN POWER AND INDUSTRY

Vol. 71
No. 9

SEPTEMBER
1953

NBP



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Editorial and Executive Offices: SOUTHERN POWER & INDUSTRY, 806 PEACHTREE ST., N. E. ATLANTA 5, GEORGIA

Facts and Trends

FOR SOUTHERN INDUSTRIAL AND POWER EXECUTIVES

September, 1953

- DOW POWER IN TEXAS is now 500,000 kw. The power system at Freeport has grown from an initial installation of two turbo-generators with a total capacity of 30,000 kw to a system of 16 turbo-generators in three plants having a capacity of 512,000 kw--a growth of approximately 1700% in 13 years. It is now one of the largest industrial power plants in the country and the largest in the South and Southwest.

There is a vast difference between methods of power production in an industrial plant of this kind and a utility plant. Most notable is load factor. Another is the use of extraction and back pressure steam for process operations, which permits production of power and steam at very interesting costs. In continuous process plants the load (steam, power or compressed air) can never be dropped except in case of emergency. For this reason Dow has an unusual amount of stand-by equipment to insure continuity of operation.

A. D. Rust, engineering consultant, The Dow Chemical Company, Freeport, Texas, describes the complete power system in this issue of SP&I. Semi-technical data features a brief history of Dow in Texas, development of the power system, and a complete description of the newest plant.

- IS ROVING DAMAGING YOUR CONVEYOR BELTS? Most damage occurs on the return run where the belt is closely confined between the frame and supports--out of sight and difficult to inspect. New Chain Belt idler design assures positive aligning action.

Device consists of a dead-shaft roller-bearing return roll, mounted at each end to a toggle-like arrangement of swivel arms suspended from the conveyor framework at an angle of approximately 45 degrees in the direction of belt travel.

Lateral movement of the belt to one side results in increased weight on that side which, due to idler construction, causes that end of the roll to move forward and downward. At the same time, opposite end of the roll is moved backward and upward. This changing of the normal position of roll guides the belt back to central position.

- FLATTENED STRAND WIRE ROPE outperforms round strand rope on such applications as hot ladle cranes, skip hoists, dredge ropes, etc. Strands have a flat outer shape, which permits four wires to contact sheave or drum grooves--thus substantially reducing abrasive wear. It also resists crushing because strands inside flattened strand rope fit together more compactly.

- PUMP DESIGN FOR CORROSIVE LIQUIDS features steel "fingers" exerting pressure on flexible plastic tubing. Liquid is pumped from one receptacle to another by merely placing the connecting tubing in the pump which has a hinged top. Different tubing sizes can be used simultaneously.

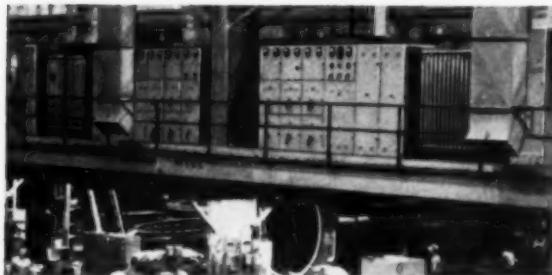
The Sigmamotor unit will pump liquids, gases or solids in solution from 45 to 250 gallons per hour at 500 rpm. Several fluids may be pumped in proportion, simultaneously and independently.

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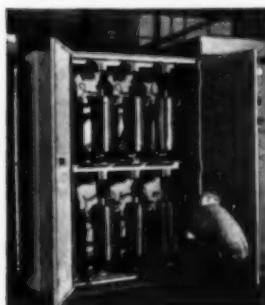


G-E SEALED-TUBE RECTIFIER SUBSTATION needs no protective fence, in no way interferes with duties of plant superintendent nearby.

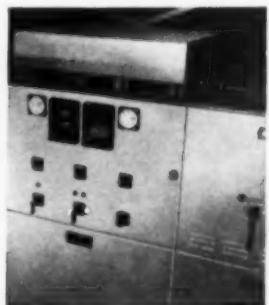
DC conversion equipment—so quiet you can work just one foot away!



PART OF a balcony-located substation, this rectifier is supplied with transformer and low voltage switchgear.



RECTIFIER section consists of six ignitron tubes, cooling and magnetic excitation systems.



HOUSING (top) contains dynamic load-absorbing resistor to dissipate brake energy.

G-E power rectifiers: no ventilation problem, no oil, no grime—and you pay less for power

When your variable speed or other d-c power needs reach 75 kw, you would do well to consider a G-E rectifier substation. It's considerably less expensive to operate and maintain than other types of conversion equipment, and it can release valuable floor space by mounting on a balcony or other out-of-the-way spot.

G-E sealed Ignitron Rectifiers are part of a complete metal-enclosed substation. Economically and easily installed, these rectifiers supply d-c power in ratings of 250 v and 600 v from 75 kw to 1000 kw. And because of the simplicity of the rectifier design—no major moving parts—downtime and maintenance costs are materially reduced.

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883-2

You can put your confidence in—

GENERAL  ELECTRIC

facts and trends (continued from page 4)

- GAS CONVERSION PROBLEMS--The Cone Mills Corporation and the Cone Finishing Company have five mills in Greensboro, N. C., which are served from one central boiler plant. When this plant was recently converted to natural gas firing, it was practical to serve these mills from a central metering point, simplifying the installation and keeping the cost of service at a minimum.

Engineering problems included: (1) Conversion of four water tube boilers from pulverized coal to natural gas. Burners and controls to be adaptable to the present boiler and other equipment already in use. (2) Equipment to be flexible, so that conversion from one fuel to another could be accomplished whenever required, with a minimum of inconvenience and with no delay. (3) Installation of pressure regulation and metering equipment. Volume of gas required, 13,000 mcf per day, peak; minimum monthly bill, 100,000 mcf.

Conversion of this plant, rated at nearly half a million lb/hr, is the largest to date in the Piedmont Carolinas. John G. Hopping, Industrial Engineer, Piedmont Natural Gas Company, Inc., Charlotte, N. C., will describe the conversion equipment and methods in an early issue of SP&I.

- 150,000 KVA POWER TRANSFORMERS, manufactured by Westinghouse for the Appalachian Electric Power Company, are designed for 330 kv--among the largest capacity transformers ever built for this high voltage. Total weight of one transformer, when installed will be 484,000 lb. Shipping weight, with oil removed and the case filled with nitrogen, is 294,000 lb.

- THE ACETYLENE PROCESSES pay big dividends in maintenance work at Republic Steel Corporation's Gadsden, Alabama, integrated steel mill. Nearly 300 men handle oxy-acetylene equipment for maintenance purposes alone.

The welding department has 48 employees while the rigger, machine, electrical, locomotive and car, pipe and boiler shops and the foundry each have a number of men who burn, heat treat, gouge, weld, heat or melt, with the oxy-acetylene flame. Millwrights and motor inspectors under the joint supervision of the maintenance superintendent and their own superintendent, make up the balance.

Although spectacular, unusual and difficult welding and cutting jobs are probably the most interesting and challenging, it is the day to day routine work--reclaiming material, hard surfacing and rebuilding production equipment--which the acetylene processes perform that pay the biggest dividends in maintenance work. "The Acetylene Processes at Republic Steel's Alabama plant" is one of the feature articles in this issue.

- NO CLUTCH NOR GEAR SHIFT in Baker-Raulang's fork truck transmission system. Power system consists of a gasoline engine, variable voltage generator and an electric motor.

Engine is directly coupled to variable voltage generator, which is in turn connected through electric wiring to a drive motor on drive axle. Generator acts as "booster" for drive motor. Travel speed is controlled entirely by foot pressure on accelerator. Maintenance economy is the important feature.

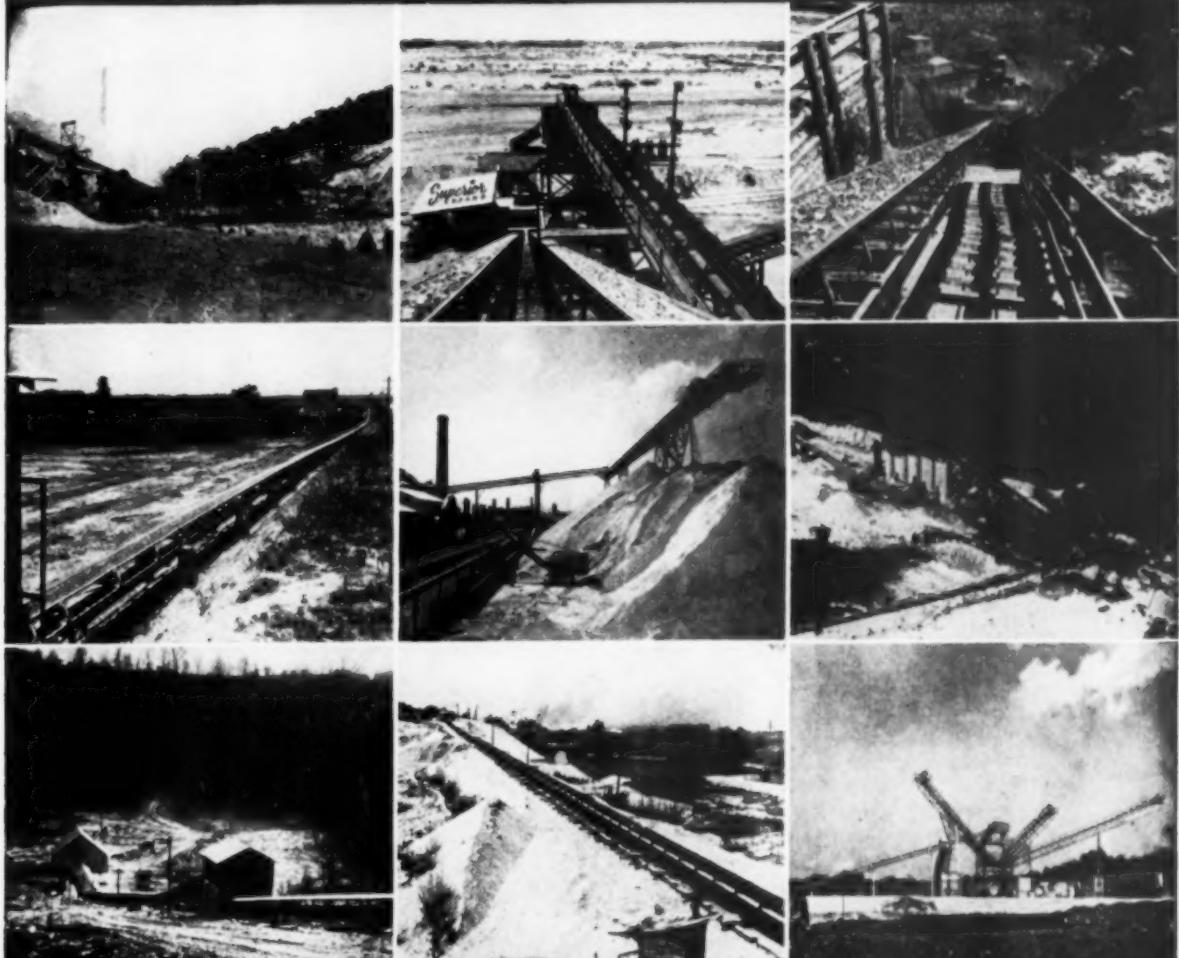
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SOUTHERN POWER & INDUSTRY. 806 Peachtree St., N.E. Atlanta 5, Ga.

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Humidity Control Method

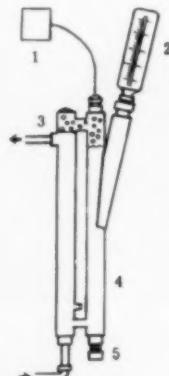
NIAGARA BLOWER COMPANY,
I-1 405 Lexington Ave., New York 17, N. Y., announces new means for accurately controlling the moisture content or relative humidity in air conditioning without the need for a moisture-sensitive element to determine humidity.

The new instrument is applied to the company's method of air conditioning in which air is dehumidified directly by a liquid absorbent. As the air conditioner removes moisture from the air stream passing through it, the absorbent liquid becomes diluted, and is continuously reconcentrated. The amount of moisture to be permitted in the conditioned air is governed by the concentration of the absorbent

Free additional information is available to readers of SP&I. Circle the item code number on one of the reader service post cards provided on pages 17-18.

liquid. This concentration has a direct relation to the boiling point of the mixture of absorbent liquid and water. Using this principle, the new instrument consists essentially of a tube equipped with a heating element. A sample of the liquid, taken after it is reconcentrated on its return flow to the air conditioner, continuously enters this tube and is heated to the boiling point. A thermostat, with its sensing element in the tube, is set at the boiling point desired. The thermo-

stat operates the concentrator unit to furnish a greater or less concentration of the absorbent liquid, as called for by the thermostat setting.



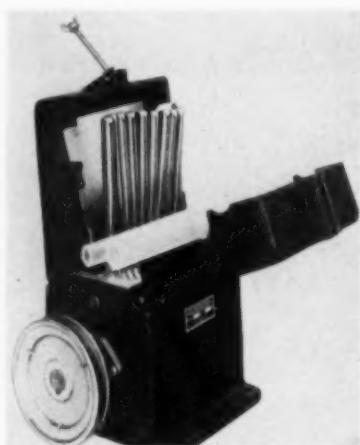
Method controls relative humidity in air conditioning without need for a moisture-sensitive element to determine humidity. (1) — Thermostat; (2) Thermometer; (3) Continuous Flow Tube; (4) Boiling Tube; and (5) Heating Element.

Pump Design for Corrosive Liquids

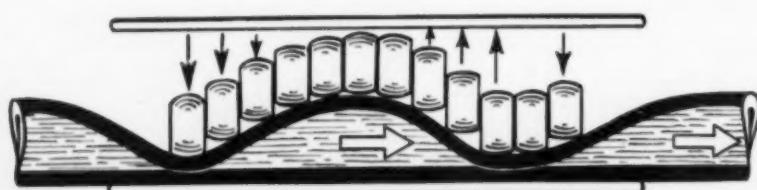
SIGMAMOTOR, INC., 513 N. Main St., Middleport, N. Y., announces a new, larger model pump, which in addition to handling tubing up to 1 in. in diameter, has a hinged top so tubing can be placed against fingers for pumping without disconnecting either end.

Liquid is pumped from one receptacle to another by merely placing the connecting tubing in the pump. Fluid in the tubing never comes in contact with the pump. There can be no contamination or corrosion from contact with metal pump parts.

Different tubing sizes can be used simultaneously. Several fluids may be pumped in proportion, simultaneously and independently. Tubing recommended for use in Sigmamotor Pumps can be supplied by the manufacturer.



A series of "fingers" in the Sigmamotor forces liquid through flexible tubing. Will pump liquids, gases or solids in solution from 45 to 250 gph at 500 rpm. No connections at the pump are necessary.



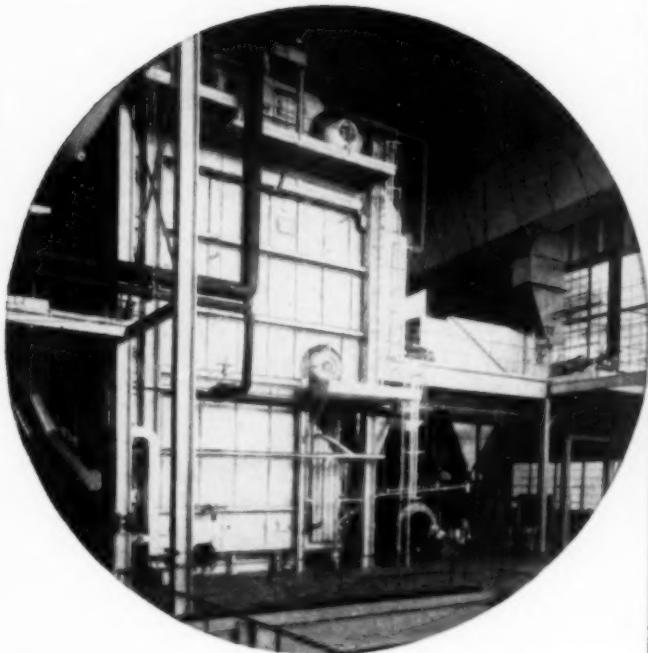
Since a change of several degrees in the boiling point of the absorbent liquid is required to effect a change of one per cent in its concentration, the control is extremely accurate and results in the holding of the relative humidity of the conditioned air to close tolerances with a simple, dependable instrument not subject to change in moisture-sensitivity.

Condenser Tube Kit

THOMAS C. WILSON, INC., I-3 Long Island City, N. Y., has introduced a new Cleaning and Application Kit for combating a common failure in condenser tubes.

This inexpensive kit is designed to apply protection against inlet end erosion, which frequently causes a tube to fail within the first few inches of its length. This method of prolonging tube life insures removal of deposits, provides excellent protective adherence and makes certain that protective coating is spread evenly on the tube.

City of Manitowoc installs fifth WICKES steam generator



R. E. Connard — Chief Engineer and General Manager

To provide a dependable source of power for the City of Manitowoc, Wisconsin, the Manitowoc Public Utilities Commission has just installed a fifth WICKES Steam Generator capable of producing 175,000 lbs. of steam per hour at 525 psi. Final steam temperature is 750°F. The new WICKES Boiler has 11,600 sq. ft. of heating surface. It is equipped with an economizer and fired by spreader stoker.



WICKES can fill your requirements for all types of multiple drum boilers generating up to 250,000 lbs. steam per hour at pressures up to 1000 psi. adaptable to any standard method of firing — oil, gas, single retort underfeed or spreader stoker. For pressures up to 900 psi. with sustained steam production up to 35,000 lbs. WICKES Type A Boilers can be shop assembled, ready for immediate installation. Write today for descriptive literature or consult your nearest WICKES representative.



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150

new equipment (continued)

For more data circle item code number
on the postage free post card—p. 17

Flattened Strand Wire Rope

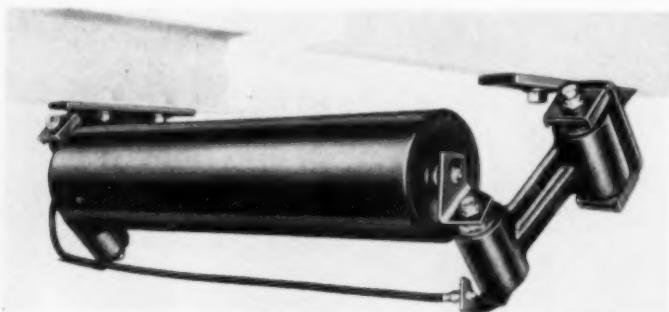
I-4 A. LESCHEN & SONS ROPE Co., St. Louis 12, Mo., is offering Hercules flattened strand wire rope for such applications as hot ladle cranes, skip hoists, dredge ropes and others.

Although adaptable for only a limited number of uses, the flattened strand wire rope can be applied in a large variety of industries. It differs from round strand rope in that the strands have a flat outer shape, which permits four wires to contact sheave or drum grooves, thus substantially reducing abrasive wear. It is said to give 100 to 200 per cent greater service where it can be satisfactorily used in place of round strand rope.



Hercules flattened strand wire rope prolongs its own life and the life of equipment, because the outside surface of flattened strand is relatively smooth, preventing corrugation and wear on sheave grooves.

It resists crushing because strands inside fit together more compactly.



Return Belt Alignment Without Side Guide Idlers

I-5 CHAIN BELT COMPANY, 1644 W. Bruce St., Milwaukee 4, Wis., has announced the development of a new type belt training (self-aligning) return idler identified as the Rex Style No. 41, which provides automatic alignment for the return belt without the use of side guide idlers.

The idler consists of a dead-shaft roller-bearing return roll, mounted at each end to a toggle-like arrangement of swivel arms suspended from the conveyor framework at an angle of approximately 45 degrees in the direction of belt travel.

Lateral movement of the belt to one side results in increased weight on that side which, due to the idler construction, causes that end of the roll to move forward and downward. At the same time, the opposite end of the roll is moved backward and upward and this changing of the normal position of the roll with the belt, guides

most belt damage from roving occurs on the return run where the belt is closely confined between the frame and supports, where it is out of sight and difficult to observe. Chain Belt Company's self-aligning return idler assures positive aligning action and greatly reduces danger of damage from belt roving.

the belt back to the central position.

The idler acts to maintain an equilibrium, with the belt in the center of the roll and the roll in normal position. The action is equally effective on horizontal, inclined, or declined conveyors, and the effect of build-up of material on the roll is negligible. Because of its principle of operation, this idler operates in one direction only.

When installed, one belt training idler unit should be located close to the head pulley to immediately center the return belt and one unit close to the tail pulley so as to center the belt on the tail pulley for subsequent loading. Additional units should be spaced as conditions warrant.

Boiler-Burner Unit

I-6 THE KEWANEE-ROSS CORPORATION, Kewanee, Ill., and the RAY OIL BURNER COMPANY, 1301 San Jose Ave., San Francisco 12, Calif., jointly announce the new Kewanee-Ray Boiler-Burner Unit for high and low pressure steam and for hot water heating.

The unit is being manufactured for high pressure steam to produce 39 to 456 certified output horsepower at 125 and 150 lb wp . . . and for low pressure 15 lb steam or 30 lb water in sizes to produce 1,313,000 to 15,300,000 Btu hourly.

The unit is designed for forced draft operation with a new multi-stage secondary air control on the burner providing a constant velocity type air stream, to the combustion zone, with a high turbulence, high turn down ratio and a high CO₂ content resulting in the utmost in combustion efficiency.

The boiler . . . complete with controls, piping and accessories . . . is assembled and shipped from the Kewanee plant. The burner arrives in a separate shipment from the Ray factory. Both boiler and burner shipments can be timed to arrive when wanted . . . at which time the assembly of the two shipments can be speedily and easily accomplished.

Lever Control for Variable Speed Motors

I-7 U. S. ELECTRICAL MOTORS INC., Box 2058, Los Angeles 54, Calif., has announced the development of a unique lever control for its Varidrive motors, to



maintain automatic speed regulation of mechanisms such as air cylinders, follower rolls and conveyors which have a movement proportional to the desired speed range.

The driven equipment can be mechanically linked to the lever. Maximum and minimum speeds may be pre-set by means of adjustable speed

(Continued on page 125)

STEAM COST REDUCED

Write for this coal saving reprint. No obligation.

Handling High Peaks at Low Cost in Coal Fired Virginia Plant

American Cyanamid Company
Calco Chemical Division—Piney River, Virginia

By C. A. Read, Director of Engineering, National Coal Association
Photographs by Clifford H. Adams, Staff Photographer, Bituminous Coal Institute

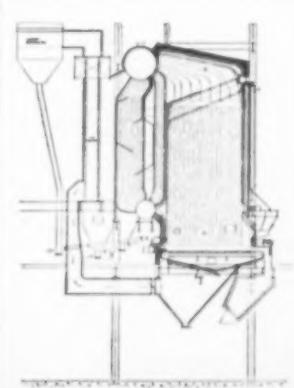
Operating record of this Virginia plant confirms design estimate of 85 per cent efficiency. Steam costs were lowered to 65 cents per thousand, including depreciation, operation, and maintenance.

At Chemical Plant

with

Detroit RotoGrate Stoker!

Sudden load surges from 50,000 to 90,000 pounds of steam per hour easily handled. Detroit Roto-Grate with Riley two drum steam generator. Air pre-heated to 310° to 345° F.

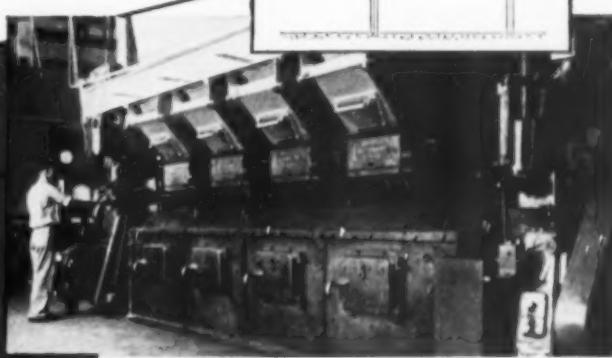


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Advanced Research Design Construction Equipment
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Boiler-Burner Team Wins Seven Straight

**Phillips Chemical Company
orders Vogt boiler and Coppus-Dennis FANMIX burner
combinations to make 1½ million pounds of steam an hour**

When a customer praises a product, that's fine. But when a customer *continually re-orders*, that's conclusive proof of user-satisfaction.

Phillips Chemical Company, Borger, Texas — producer of synthetic rubber — first installed Henry Vogt boilers with FANMIX burners back in 1943. As plant production increased, Phillips again purchased the same equipment — in 1946, and again in 1951.

Today, a total of 7 Vogt boilers equipped with Coppus-Dennis FANMIX burners provide 1,750,000 lbs. steam each hour for the production of synthetic rubber. The boilers are designed for 250,000 lbs. steam peak operation but have been operated as high as 275,000 lbs. per hour. Their performance is typical of the efficiency of boilers equipped with Coppus-Dennis FANMIX burners.

FANMIX • Better Combustion • Better Efficiency • Higher Ratings

All Coppus-Dennis FANMIX burners — for gas as well as combination gas-oil — have the exclusive FANMIX action. Their *revolving orifices* give violent mechanical mixing and agitation of gas and air, therefore causing instantaneous and complete combustion with *minimum excess air* (5% excess air is not unusual).

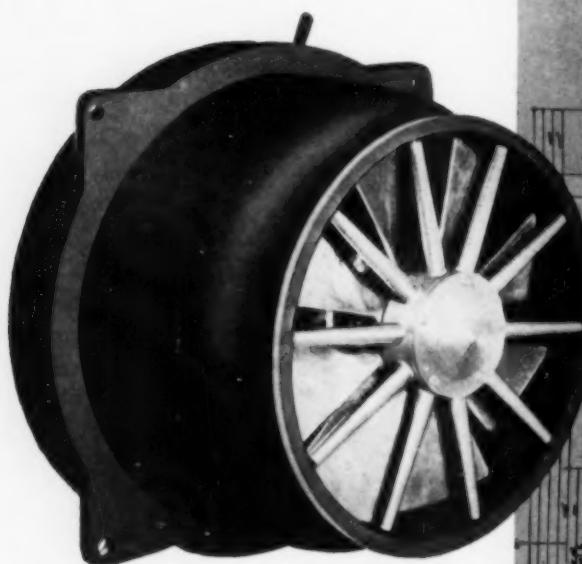
Because of this exclusive FANMIX action, furnace space is not required for mixing and *higher boiler ratings* are thus easily obtained. The burners also have a shorter flame than any other burner and will not cause flame impingement.

What's more, by incorporating a *fan* as an integral unit, FANMIX burners have *no draft loss* across the burner. As a result, increased ratings are possible regardless of draft conditions.

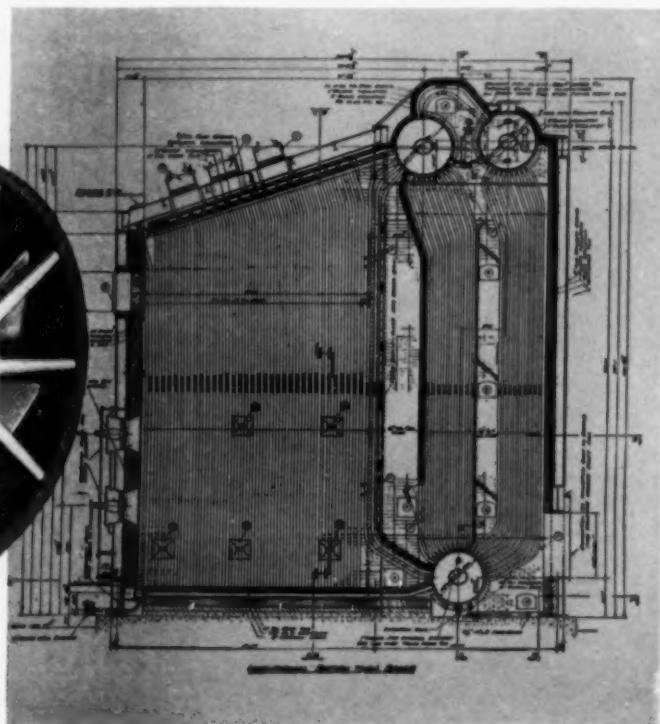
FANMIX action, with its quick completion of combustion, gives *lower exit temperatures*.

If you are not using Coppus-Dennis FANMIX burners in your present boiler, why not plan now to take advantage of the exclusive FANMIX action? You need no forced draft equipment, increase in stack or increase in furnace volume for FANMIX operation. And you get increased capacity. When specifying FANMIX on new boilers, you can plan on reduced combustion space, higher ratings, less stack height or reduced induced draft capacity — and, of course, *no forced draft equipment*.

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JET REACTION is utilized to rotate fan which is integral part of burner. Ideal mixture for fast, complete combustion and peak efficiency is caused by automatically proportioned high velocity air passing at right angles through fuel.



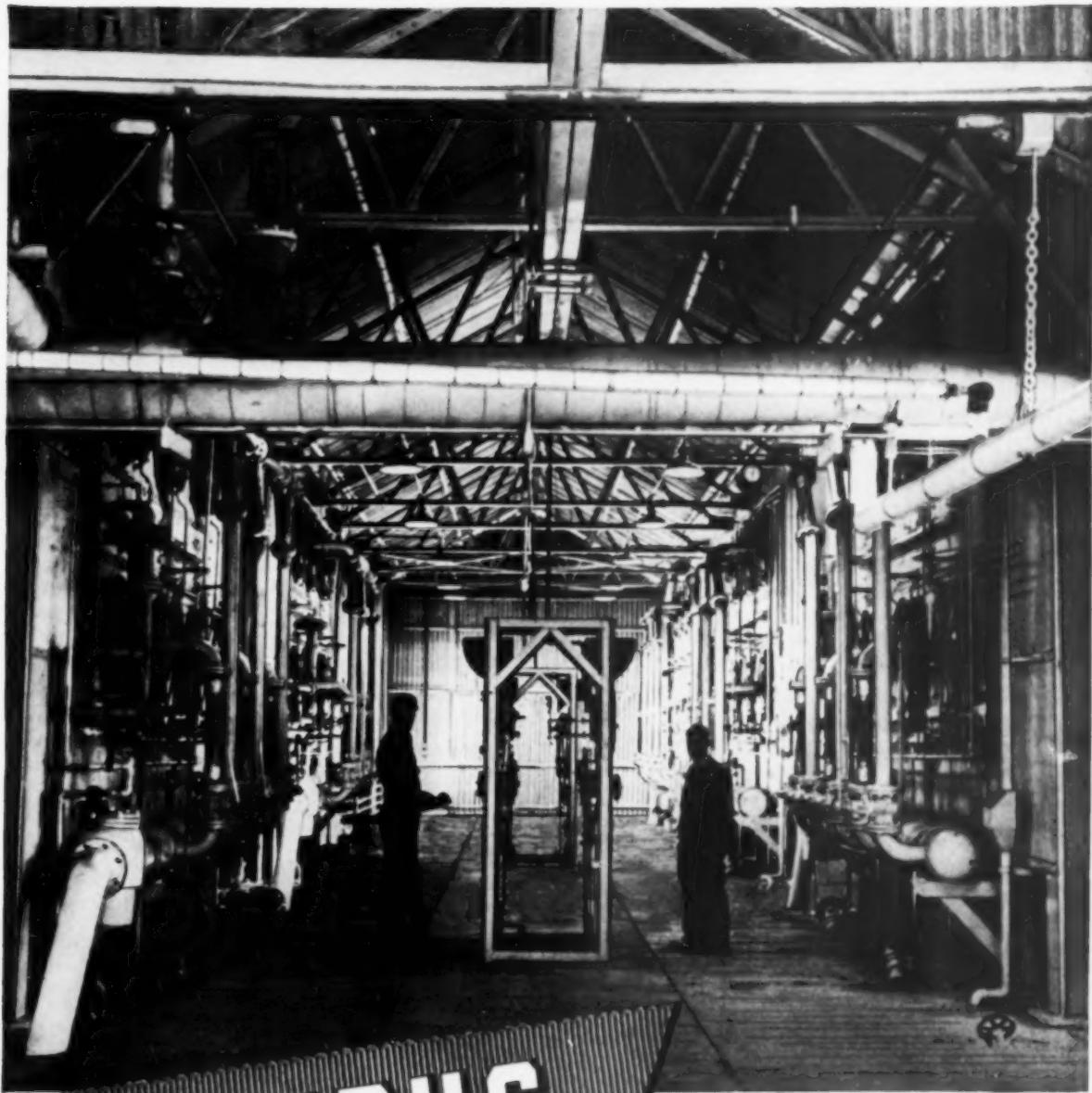


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HENRY VOGT BOILERS are here shown installed in the Phillips Chemical Company, Borger, Texas. Boilers use Coppus-Dennis FANMIX burners.

52 REPEAT

for B&W Integral-Furnace

from One Automotive

Seventeen years ago, in 1936, a large automobile manufacturing concern ordered its first B&W Integral-Furnace Boiler. Since then, 52 times—under 52 different sets of circumstances—the customer has come back for more units of this type. Total steam capacity installed and on order now amounts to over 5,750,000 lb/hr, with unit capacities ranging from 20,000 lb/hr to 190,000 lb/hr.

Like this user's own splendid reputation for customer loyalty, repeat orders represent a high percentage of total B&W Integral-Furnace Boiler sales . . . testifying to the high availability, over-all economy, and operating

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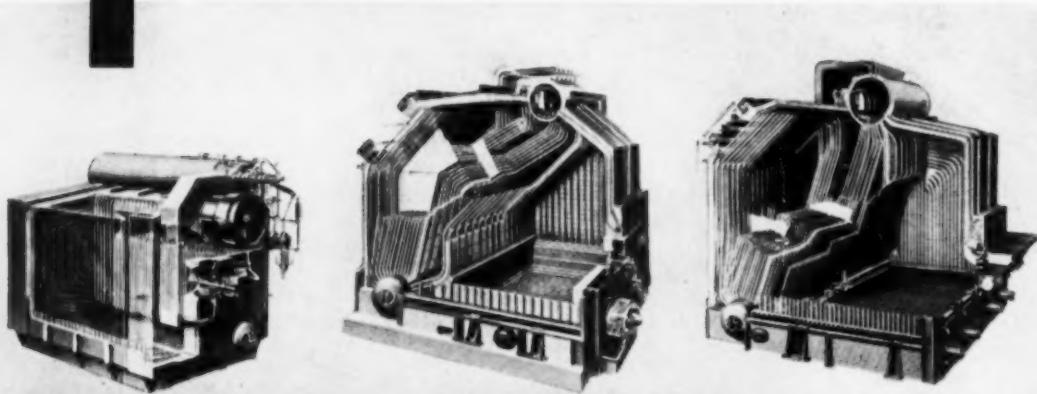
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Minimum floor space and headroom requirements
High fuel economy
Smokeless combustion
Adaptable to all fuels and firing methods
Economical fast steaming
Water-cooled furnace

Clean, dry steam at all ratings even with high boiler water concentrations
Quick response to wide and heavy load swing demands
Easy to inspect and clean
High availability with least attention

G-571



TYPE FM
2,800-28,000 lb/hr
up to 250 psi
Oil and Gas Firing

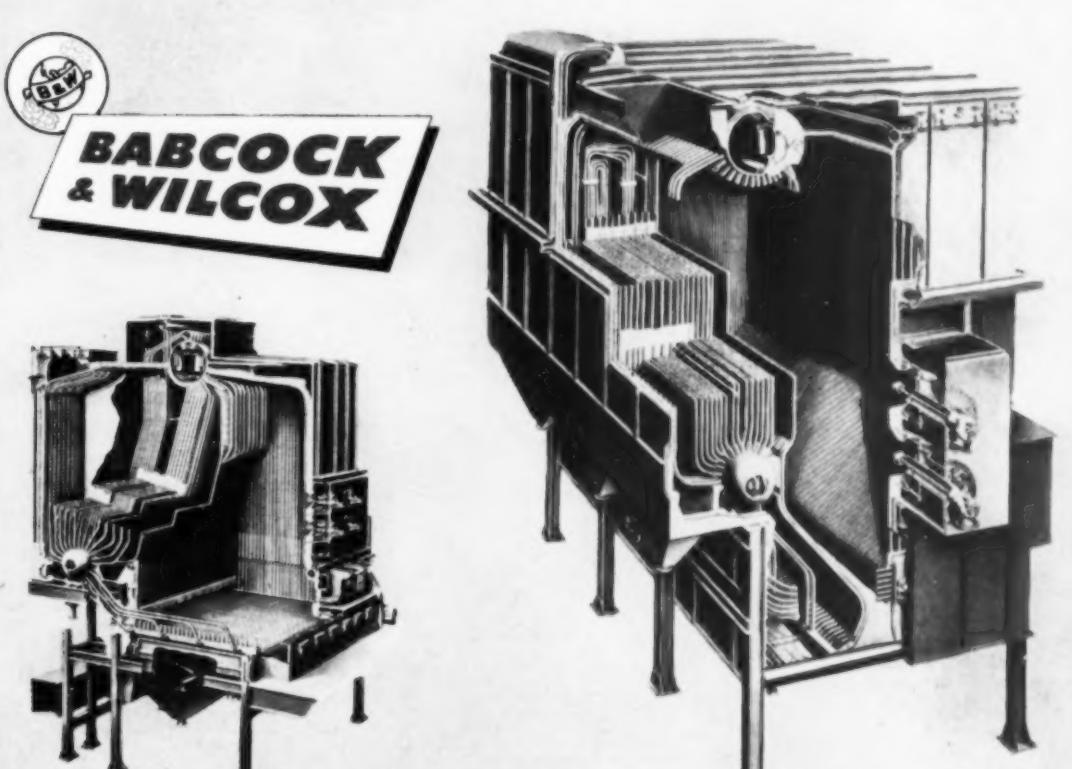
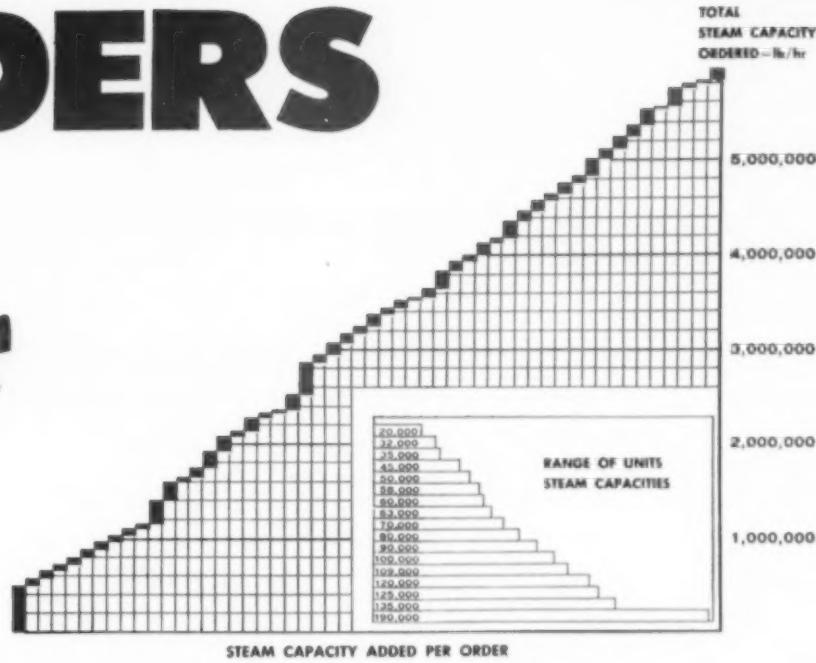
TYPE FF
8,000-30,000 lb/hr
up to 600 psi
Stoker, Oil, and Gas Firing

TYPE FJ
30,000-70,000 lb/hr
up to 800 psi
Stoker, Oil, and Gas Firing

ORDERS

Boilers

Customer



TYPE FL

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up to 1050 psi

Stoker, Oil, and Gas Firing

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50,000-350,000 lb/hr
up to 1050 psi

Pulverized Coal, Oil, and Gas Firing

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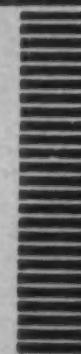
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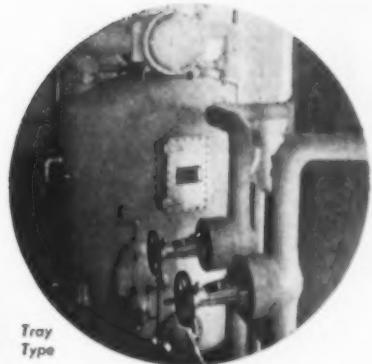
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offices in 29 principal cities**

In Canada: Canadian General Electric Co., Ltd., Toronto
In Mexico: Babcock & Wilcox de Mexico, S. A., Mexico City
In Europe: Recuperation Thermique & Epuration, Paris
In Cuba: Laurence E. Daniel, Inc., Havana
In South America: Servicios Electricos, C.A. (S.E.C.A.) Caracas, Venezuela
In Puerto Rico: F. A. Ortiz & Co., San Juan 5



Hot Process Softeners • Deaerators • Neutralizers • Demineralizers • Reactors • Continuous Blow-Off • Specialties • C-B Systems



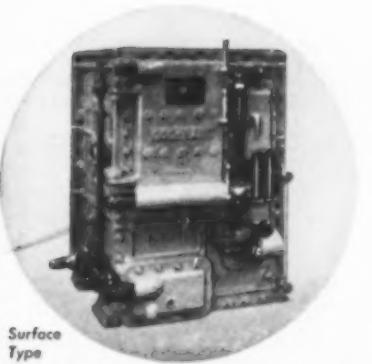
Tray
Type



Atomizer
or Spray Type

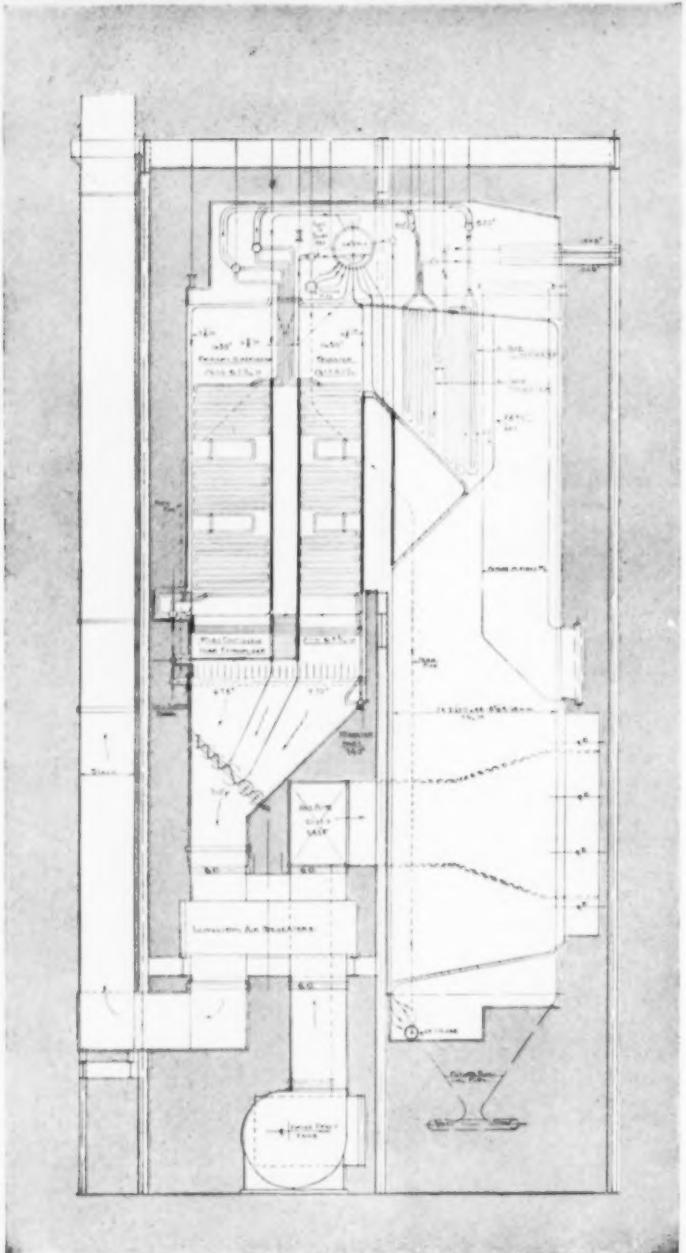


Jet
Tray
Type



Surface
Type

TEXAS GOES FOR RILEY



RILEY REHEAT UNITS

recently purchased by

TEXAS ELECTRIC SERVICE CO.

DALLAS POWER & LIGHT CO.

HOUSTON LIGHTING & POWER CO.

Capacity—1,250,000 lbs./hr.

Design Pressure—2125 psig

Superheater Outlet Pressure—1925 psig

Steam Temperature—1005°F.

Reheater Capacity—1,148,000 lbs. hr.

Reheater Outlet Pressure—470 psig

Reheater Temperature—1005°F.

Efficiency, Gas Firing—83.7 %

Pressurized Furnace

Fired by Gas—Oil Standby

Designed for future conversion to lignite firing

Ebasco Services, Inc., Engineers

Method of Steam and Reheat Temperature Control

Steam temperature is maintained constant between 900,000 and 1,250,000 lbs./hr. and reheater temperature between 825,000 and 1,148,000 lbs./hr. by means of gas flow control dampers.

Gas flows over superheater and reheater primary surface are automatically controlled by dampers located below the economizer. This provides definite control of both steam and reheat temperatures. The flow of gases over superheater and reheat surface is proportioned to give the desired temperature of 1005°F. from each.

At high loads where the quantity of gas passing over superheater and reheater surfaces would give higher than desired temperature, part of the gas is by-passed through the open lane between superheater and reheater surfaces. Note that the quantity of economizer surface in the by-pass line is greater to give approximately uniform economizer exit gases.



RILEY

STOKER CORPORATION, WORCESTER, MASS.

Boston Cincinnati New York Philadelphia Washington
Atlanta Charlotte Denver Salt Lake City New Orleans
Los Angeles

Buffalo St. Louis Pittsburgh Kansas City Cleveland St. Paul Detroit Tulsa
Portland Seattle Chicago Houston

BOILERS • PULVERIZERS • BURNERS • STOKERS • SUPERHEATERS • ECONOMIZERS

REHEAT UNITS IN A BIG WAY

★ TEXAS ELECTRIC SERVICES CO.

★ DALLAS POWER & LIGHT CO.

★ HOUSTON LIGHTING & POWER CO.

all have recently ordered 1,250,000 lbs./hr., 2125 design pressure, 1005°F. steam temperature and 1005°F. reheat temperature Riley steam generating units. These will be the first gas-fired reheat units to be installed in Texas.

While the Riley units purchased by Texas Electric Service Company and Dallas Power and Light Company are the first Riley units ordered by these companies, the two 1,250,000 lbs./hr. Riley reheat units purchased by Houston Lighting and Power Company will be the tenth and eleventh Riley units installed by them since 1938 and will give Houston over 7,000,000 pounds per hour capacity of Riley units.

When such a large public utility company places ten different orders with Riley extending over a 15-year period, isn't that conclusive evidence that Riley is a good company to do business with, that the performance of Riley equipment has been entirely satisfactory and that Riley gives their customers their money's worth.

It will pay you to investigate Riley equipment and request a Riley proposal when you are considering steam generating or fuel burning equipment. Riley users will assure you that you can rely on Riley.

A survey of your Power Plant by a consulting engineer will possibly show ways of making surprisingly large savings in your power costs

COMPLETE STEAM GENERATING UNITS

WATER-COOLED FURNACES • STEEL-CLAD INSULATED SETTINGS • AIR HEATERS

Other Riley Public Utility Installations

DEPARTMENT OF WATER AND POWER
CITY OF LOS ANGELES, CALIFORNIA
1,200,000 lbs./hr. 2075 psig, 1000°F.
and 1005°F. reheat.

LOUISIANA POWER & LIGHT CO.
1,000,000 lbs./hr. 1725 psig, 1005°F.
and 1005°F. reheat.

Ebasco Services, Engineers

SOUTHWESTERN GAS & ELECTRIC CO.
630,000 lbs./hr. 1050 psig, 1005°F.
Sargent & Lundy, Engineers

MONONGAHELA POWER CO.
700,000 lbs./hr. 1050 psig, 905°F.
Sanderson & Porter, Engineers

UTAH POWER & LIGHT CO.
575,000 lbs./hr. 1500 psig, 1000°F.
and 1000°F. reheat.

Bechtel Corp., Engineers

CENTRAL ILLINOIS LIGHT CO.
600,000 lbs./hr. 950 psig, 900°F.
Commonwealth Services, Engineers

NORTHERN STATES POWER CO.
385,000 lbs./hr. 1500 psig, 950°F.
Project Services & Engineering, Engineers

SOUTH CAROLINA PUBLIC SERVICE AUTHORITY
460,000 lbs./hr. 1025 psig, 900°F.
Ford, Bacon & Davis, Engineers

THE POTOMAC EDISON CO.

700,000 lbs./hr. 1050 psig, 905°F.
Sanderson & Porter, Engineers

IOWA ELECTRIC LIGHT & POWER CO.
300,000 lbs./hr. 975 psig, 910°F.

GULF POWER CO.
325,000 lbs./hr. 1000 psig, 900°F.
Southern Services, Engineers

SOUTH CAROLINA GAS & ELECTRIC CO.
400,000 lbs./hr. 1475 psig, 955°F.
Gilbert Associates, Engineers

UTAH POWER & LIGHT CO.
620,000 lbs./hr. 1500 psig, 955°F.
Bechtel Corp., Engineers

IOWA-ILLINOIS GAS & ELECTRIC CO.
250,000 lbs./hr. 975 psig, 905°F.

PUBLIC SERVICE CO. OF INDIANA
400,000 lbs./hr. 1000 psig, 910°F.
Sargent & Lundy, Engineers

DEPARTMENT OF WATER AND POWER
CITY OF LOS ANGELES, CALIFORNIA
825,000 lbs./hr. 1200 psig, 900°F.

ARKANSAS POWER AND LIGHT CO.
650,000 lbs./hr. 1050 psig, 905°F.
Ebasco Services, Inc., Engineers

UNION ELECTRIC CO. OF ILLINOIS
370,000 lbs./hr. 1000 psig, 900°F.

SOUTHWESTERN PUBLIC SERVICE CO.
330,000 lbs./hr. 1050 psig, 900°F.

CAROLINA POWER AND LIGHT CO.
330,000 lbs./hr. 1025 psig, 905°F.
Ebasco Services, Inc., Engineers

PENNSYLVANIA ELECTRIC CO.
300,000 lbs./hr. 975 psig, 900°F.
Burns-Roe, Engineers

OHIO Edison Co.
225,000 lbs./hr. 925 psig, 900°F.
Commonwealth Services, Engineers

MISSISSIPPI POWER CO.
230,000 lbs./hr. 975 psig, 860°F.
Southern Services, Engineers

WEST PENN POWER CO.
210,000 lbs./hr. 1000 psig, 910°F.
Sanderson & Porter, Engineers

INTERSTATE POWER CO.
200,000 lbs./hr. 725 psig, 910°F.
Sargent & Lundy, Engineers

... it will pay you to visit
modern Riley installations
before purchasing Boiler or
Fuel Burning Equipment

a teaspoonful of steam!



a NEW REDUCING VALVE

HERE'S THE ANSWER
TO YOUR SMALL FLOW
CONTROL PROBLEMS

for accurate, foolproof regulation of small flows of steam, air, gas or liquids, with inlet pressures to 1000 psi and reduced pressures from 2 to 400 psi.

Change operating conditions quickly and easily with simple, handwheel adjustment—no need to waste time changing springs or swapping parts. Check these widely accepted Leslie features that are standard in the new, efficient, Leslie Small Flow Reducing Valve.

Check these Features

- Simple, compact construction
- Top quality materials
- Metal Diaphragm
- Entirely enclosed—no stuffing boxes
- Corrosion resistant springs
- Hardened stainless steel valve
- Interchangeable inner valves

SEND FOR DESCRIPTIVE BULLETIN 511-A
WITH COMPLETE CAPACITY TABLES

Before you order—

The new Class LCB is just one of the many units that are *special* with most manufacturers but are *standard* with Leslie.

Check to see if any pressure, temperature or level control you want is standard with Leslie, before you order. Play it safe. Your Leslie Engineer is listed under "Valves" or "Regulators" in the classified telephone directory in principal cities.



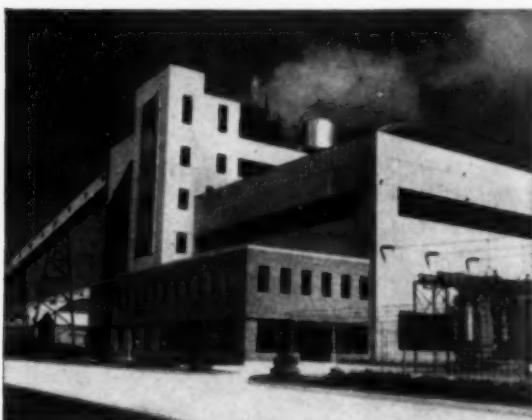
THE FIRST NAME IN PRESSURE,
TEMPERATURE AND LEVEL CONTROLS

Since 1900

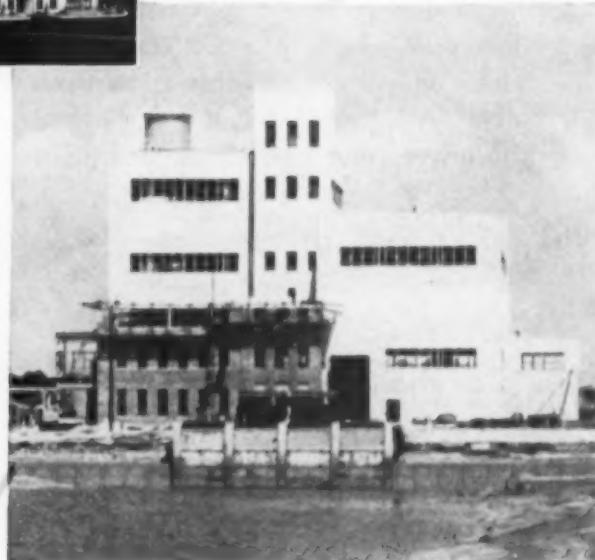
LESLIE CO., 261 Grant Avenue, Lyndhurst, New Jersey



Yates Plant at Whitesburg, Georgia, was dedicated in October, 1952.



McManus Plant near Brunswick, Georgia, went into service in November, 1952.



Hammond Plant near Rome, Georgia, will go into service late in 1953.

Oh, I see

...they're using
our valves at
Georgia Power

Newest in their growing chain of giant power plants for expanding service in Georgia are these three plants. Indicative of their builders' desire to assure maximum dependability is their selection of OIC Valves for these plants.

Every OIC Valve is *precision-engineered* and *precision-made* to give longer, trouble-free service at no extra cost to you. OIC offers *precision-application help* in selecting valves best suited to each job.

THE OHIO INJECTOR COMPANY
Wadsworth, Ohio



VALVES ... FORGED & CAST STEEL, IRON & BRONZE

R/M's **BIG 7** packing types cover 95% of all packing needs

Yes, unless you have extremely rare packing applications, your needs can be met entirely by R/M's new basic line of *just seven* field-tested packing types. Three or four are probably all that you will need to take care of your requirements. Ask your distributor to show you how standardizing on R/M's "Big 7" can lower your inventories, simplify your ordering, reduce your downtime.



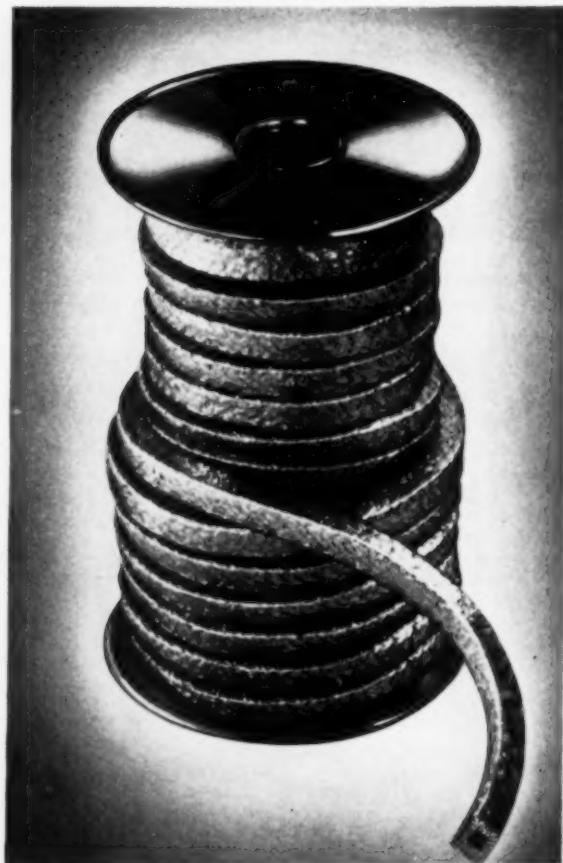
Here's the story on TYPE 2

Type 2 Is R/M High Pressure Valve

Stem Packing. It comes in two numbers—R/M 303 and R/M 1326-J. Both of these packings have a core of universal plastic packing over which is braided a woven asbestos jacket.

R/M 303 has Monel wire in the jacket. This packing is recommended for valve stems on high pressure and high temperature equipment to 800°F; for pressure equivalents of saturated and superheated steam; for valve stems with Brinell hardness of 400 or better.

R/M 1326-J is non-metallic. It is recommended for steel and non-ferrous valve stems handling temperatures to 800°F. It is excellent for all types of expansion joints.



PACKINGS
RAYBESTOS-MANHATTAN, INC.
PACKING DIVISION, MANHEIM, PA.

FACTORIES: Bridgeport, Conn.; Manheim, Pa.; No. Charleston, S.C.; Passaic, N.J.; Neenah, Wis.; Crawfordsville, Ind.; Peterborough, Ontario, Canada

RAYBESTOS-MANHATTAN, INC., Manufacturers of Packings • Teflon Products
Asbestos Textiles • Industrial Rubber Products • Abrasive and Diamond Wheels
Rubber Covered Equipment • Brake Linings • Brake Blocks • Clutch Facings • Fan
Belts • Radiator Hose • Sintered Metal Products • Bowling Balls



B&W KAOCAST

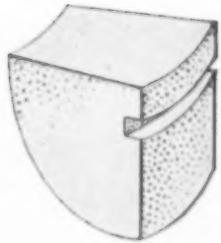
*goes in
more furnaces
because...*



Versatile B&W Kaocast can be molded quickly and easily with your own labor. It can also be cast directly in place or applied with a cement gun. This unique 3000 degree refractory castable has high resistance to spalling and slag attack, low volume change and negligible reheat shrinkage. Consult a B&W Refractories Engineer on your specific applications and see how B&W Kaocast can save money for you.

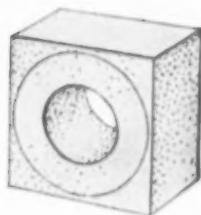
It cuts inventory

Nose arches for oil heaters were formerly made with special shapes of ordinary firebrick. Switching to quickly moldable Kaocast eliminated need for expensive special-shape inventory . . . minimized delays. In addition, side by side tests proved that Kaocast far outlasted the ordinary firebrick.



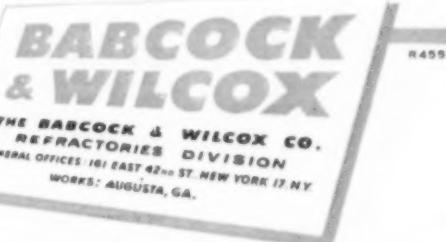
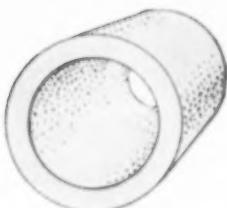
It speeds repairs

Kaocast was specified for the charging front of a forging furnace, used to heat heavy pipe ends. The reason? Kaocast linings were molded faster . . . give longer service, could be made when convenient and stored 'til needed.



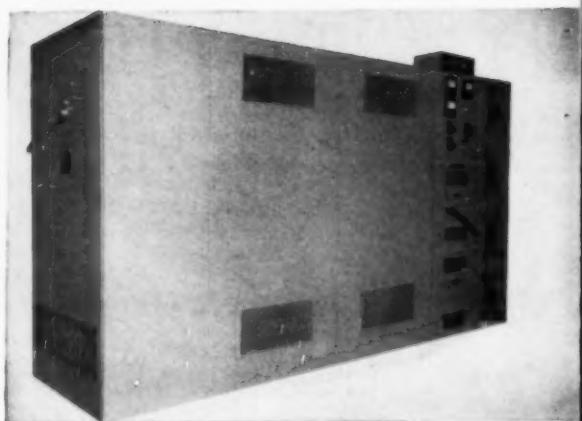
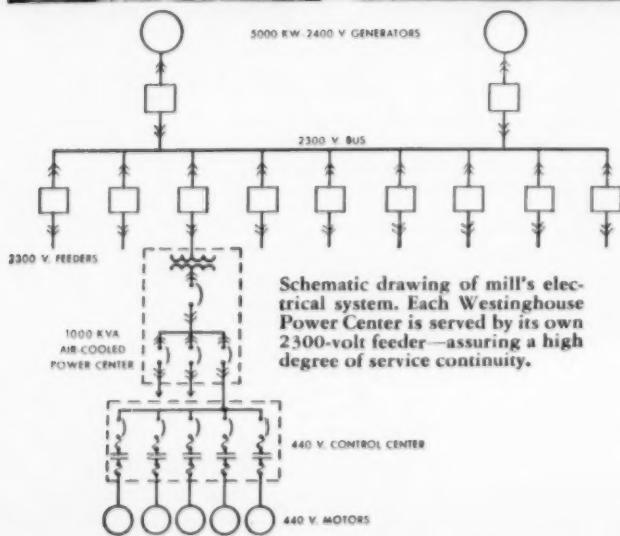
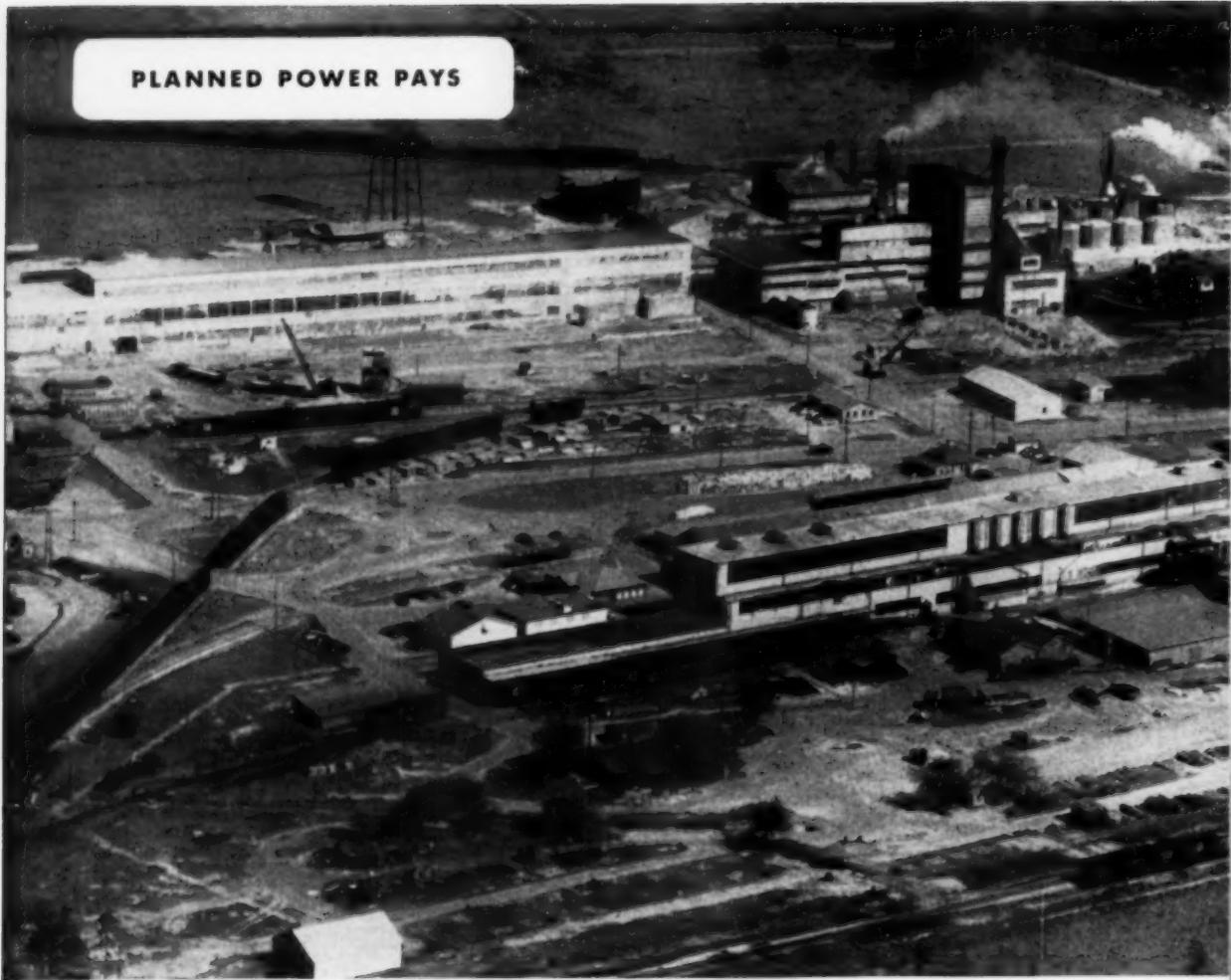
It lasts longer

A chemical plant found that burner tile for a heating furnace made of an ordinary castable stood up only 3 to 4 months. But Kaocast burner tile stayed on the job 16 months and longer. Thousands of pounds of Kaocast have been used for this and many other applications in this plant.



B&W REFRactories PRODUCTS — B&W Alumina Firebrick • B&W BO Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick
B&W Refractory Castables, Plastics and Mortars • OTHER B&W PRODUCTS—Stationary & Marine Boilers and Component Equipment...
Chemical Recovery Units . . . Seamless & Welded Tubes . . . Pulverizers . . . Fuel Burning Equipment . . . Pressure Vessels . . . Alloy Castings

PLANNED POWER PAYS



Westinghouse 1000-kva Air-Cooled Power Center, 2300/440 volts, is factory assembled as a complete unit. Rating can be increased 25 percent by adding forced ventilation.



Get reliable, low-cost power by bringing high voltage close to loads

Men responsible for plant engineering functions will be interested in how St. Regis Paper Company provided reliable, low-cost electrical service in their new Pensacola mill. Round-the-clock production schedules had to be maintained—365 days a year. Power failures would work extreme hardship.

Called during the blueprint stage, Westinghouse helped the mill's engineers plan a modern radial distribution system. It is so designed that each power center is served by its own primary feeder. Thus, feeder and transformer faults are isolated quickly to the services of a single power center. A higher degree of service continuity is assured.

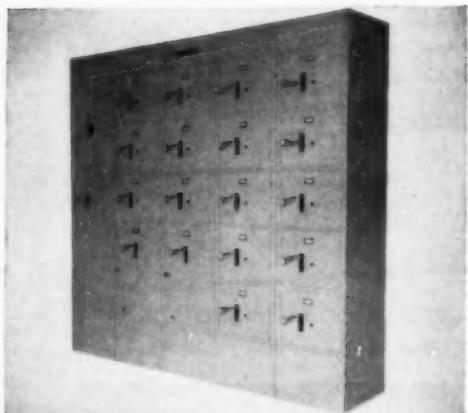
Westinghouse unitized equipment—pre-assembled and tested—helped keep power distribution costs to a minimum. Long runs of heavy, 440-volt feeders were eliminated. Feeder loss was cut. Wiring and conduit were greatly reduced.

Further, maintenance problems were simplified, since breakers and controls are easily accessible...and parts are standardized and interchangeable.

CONSIDER THIS: It takes sound planning and co-ordinated equipment to provide modern distribution systems, capable of meeting your plant power needs today and in the years ahead. Westinghouse offers you both...and backs them with years of experience, gained throughout all industry.

A call to your nearest Westinghouse office will bring an application engineer, well qualified to go over your distribution problems with you and your engineers. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

J-94956



Starters are grouped in self-standing Westinghouse 440-volt Control Centers—factory assembled and wired with terminal boards. This simplifies installation and maintenance.

YOU CAN BE **SURE**...IF IT'S
Westinghouse



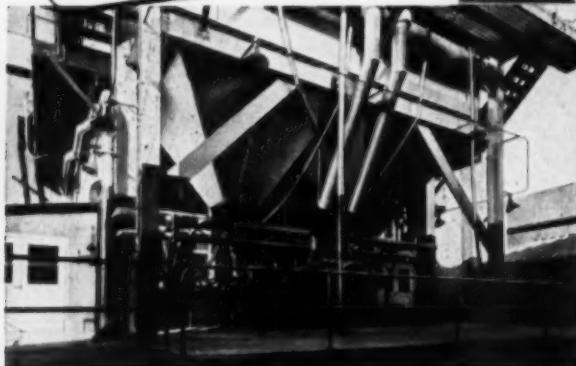
"We modernized our plant, installed new COAL-burning equipment, **AND CUT OUR FUEL COSTS 45%!"**

**"In Addition, Automatic Coal-
and Ash-Handling Equipment
Cuts Labor Costs 60%!"**



says MR. A. J. GOETZ, Executive Vice President,
River Raisin Paper Co., Monroe, Michigan.

"We recently modernized our entire plant following an extensive engineering survey. New coal-burning and coal-handling equipment was installed . . . heat losses were reduced . . . efficiency raised. As a result, our fuel costs have been cut 45 to 50%—proving to us that you just can't beat bituminous coal burned the modern way."



This view shows how River Raisin has installed its modern fly-ash reinjection system at the rear of the boilers but outside the plant. The plant also features outdoor coal handling to save additional interior space.



"We chose these modern spreader stokers for their advantages of low maintenance, low power requirements, and their ability to meet fairly rapid load changes. They give us maximum efficiency under all operating conditions."

Modernizing your present plant? Building a new one? In either case let a consulting engineer show you exactly how you can meet your specific needs with a modern coal installation—and at the same time save more money than you thought possible.

Automatic coal- and ash-handling equipment can cut your labor costs to a minimum. And, today, with a modern combustion installation, you can actually get 10 to 40% more power from each ton of coal than was possible a few years ago.

Moreover, with coal you'll never have to worry about a shortage of fuel. America's coal reserves are virtually inexhaustible, and this coal is mined by one of America's most efficient and productive industries. This means that coal users—unlike those committed to other fuels—get the advantage of dependable future supply as well as more stable prices.

If you operate a steam plant,
you can't afford to ignore these facts!

COAL in most places is today's lowest-cost fuel.
COAL resources in America are adequate for all needs—for hundreds of years to come.

COAL production in the U. S. A. is highly mechanized and by far the most efficient in the world.

COAL prices will therefore remain the most stable of all fuels.

COAL is the safest fuel to store and use.

COAL is the fuel that industry counts on more and more—for with modern combustion and handling equipment, the inherent advantages of well-prepared coal net even bigger savings.

BITUMINOUS COAL INSTITUTE

A Department of National Coal Association, Washington, D. C.

FOR HIGH EFFICIENCY & FOR LOW COST
YOU CAN COUNT ON COAL!

The A-S-H Hydro-Ejector System

removes ashes
at low cost



Cross-section of Hydro-Ejector.

Note that high-pressure nozzle is completely out of flow-stream.

- Low initial investment
- Economical operation and maintenance

These are the vital, cost-cutting advantages that the A-S-H Hydro-Ejector System offers you because of its simple, clean design and the use of special wear-resistant alloys throughout. If your operating conditions permit its application, you can slash your ash-disposal budget right from the start. A list of plants where Hydro-Ejector Systems are now operating will be gladly sent on request Regardless of the size of your plant, there's an A-S-H jetting, pumping, or pneumatic system to help you save your disposal dollar. Let our engineers tell you how.

THE ALLEN-SHERMAN-HOFF CO.

Dept. L—259 E. Lancaster Ave., Wynnewood, Pa.
Offices and Representatives in Principal Cities



HYDROJET

(hydraulic)

materials handling systems

HYDROVAC

(pneumatic)



Fig. 500—125-pound Bronze Gate Valve with screwed-in bonnet, inside screw rising stem and tapered wedge.



Fig. 1700—125-pound Iron Body Bronze Mounted Gate Valve with tapered solid wedge. Made in sizes 2" to 30", inclusive.

For complete satisfaction, install POWELL VALVES

To be completely satisfactory, a valve must function perfectly, give maximum length of service and require minimum maintenance. To do this it has to be exactly right—in design and materials—for all the conditions under which it must operate. And because Powell makes just such a valve for every service in modern industry, Powell Valves always give complete satisfaction.

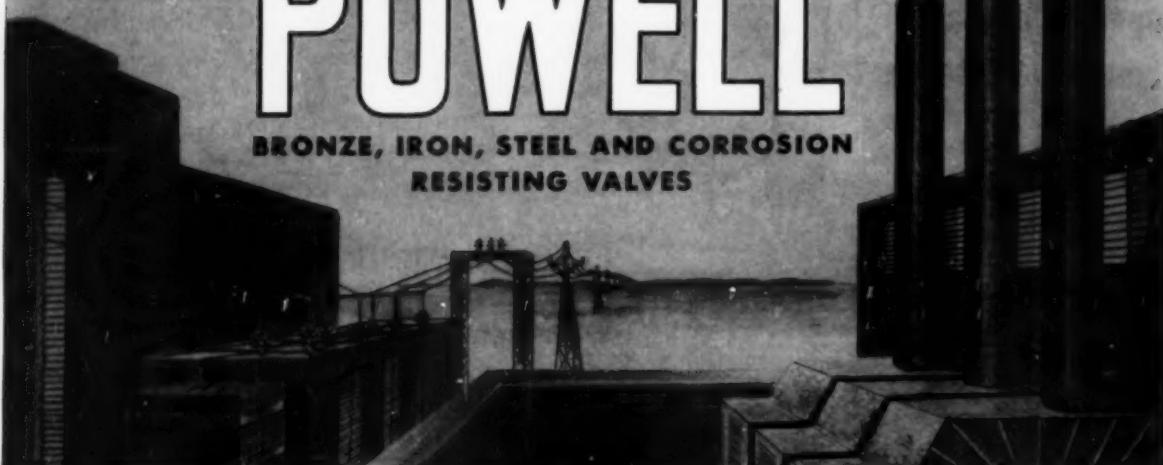
The Wm. Powell Co., Cincinnati 22, Ohio



Fig. 3001 W. E.—300-pound Cast Steel Globe Valve with welding ends, bolted flanged yoke and outside screw stem.

POWELL

BRONZE, IRON, STEEL AND CORROSION
RESISTING VALVES



With the All-Motor

ALL-STEEL

FALK Motoreducer

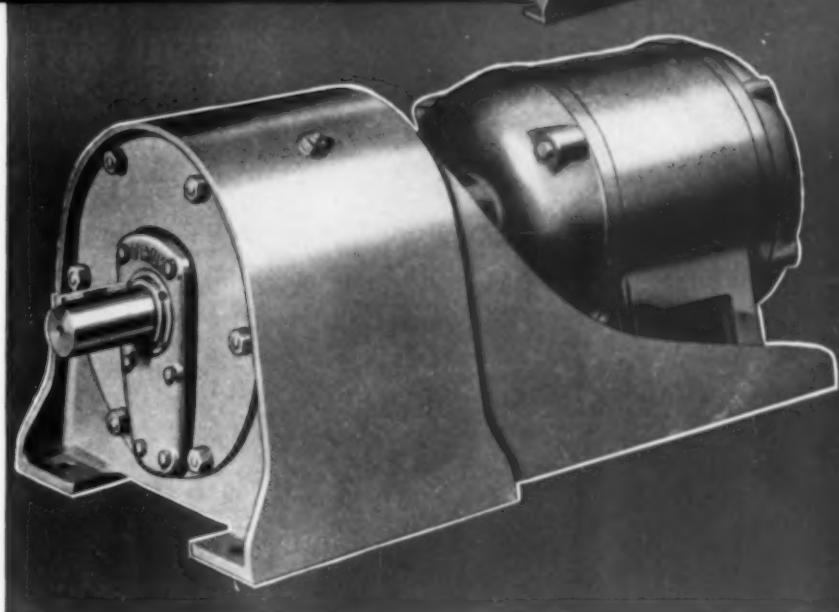
you can interchange motors in minutes...on the job!

**Fast, easy maintenance
gives savings in time
and money**

With the all-steel, All-Motor type FALK Motoreducer . . . the only complete and compact motorized reducer with a separately mounted, resilient Steelflex coupling-connected motor . . . you can replace or interchange motors, or even parts, in minutes—on the job, without long and costly "down time"! Ratios can be changed (within capacity) without motor modification.

Any make, speed, or type of standard foot-mounted motor within the unit's AGMA rating is usable without modification on this All-Motor type Motoreducer. Motors with variable speed drive arrangement can be used, if desired. No "partial" motor or special shaft is required in event of motor replacement—simply use a complete motor, available for quick delivery from factory or local stocks without expensive delays.

Add to these exclusive maintenance-saving advantages the FALK "In-built" Factors, described at the right, and you have an unbeatable combination of quality, application adaptability, dependability, long-range economy, and dollar-for-dollar value. Write for Bulletin 3104.



**Every FALK Motoreducer
has these "In-built" Factors—**

Positive Lubrication. Large sump capacity . . . oil-tight construction assures clean lubricant . . . direct dip of revolving elements provides positive lubrication at all speeds.

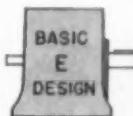
Wide Speed Range. Selective ratio combinations provide output speeds from 1.5 rpm to 1430 rpm with stock gears.

Streamlined Inside and Outside. Smooth, clean surfaces; machine welded construction conforms to NEMA motor frames.

Sealed Housing. Dual closures and one-way vents keep oil in, dust and moisture out. Units are splash-proof, leakproof, dustproof.

Precision Gearing. Heat treated alloy steel, precision cut and shaved helical gearing throughout . . . quiet-operating crown shaved pinions . . . taper bored gears for easy ratio changes.

All-steel Housings. Unbreakable, strong, rigid. Generous overhung load capacities provided by wide bearing spans, large shafts and bearings.



EC

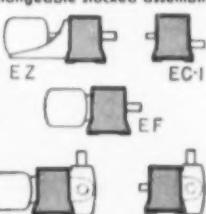
The basic E design permits maximum use of standardized parts . . . closer control over materials, processing, inspection and assembly . . . resulting in faster delivery from interchangeable stocked assemblies.



EZ



EFX

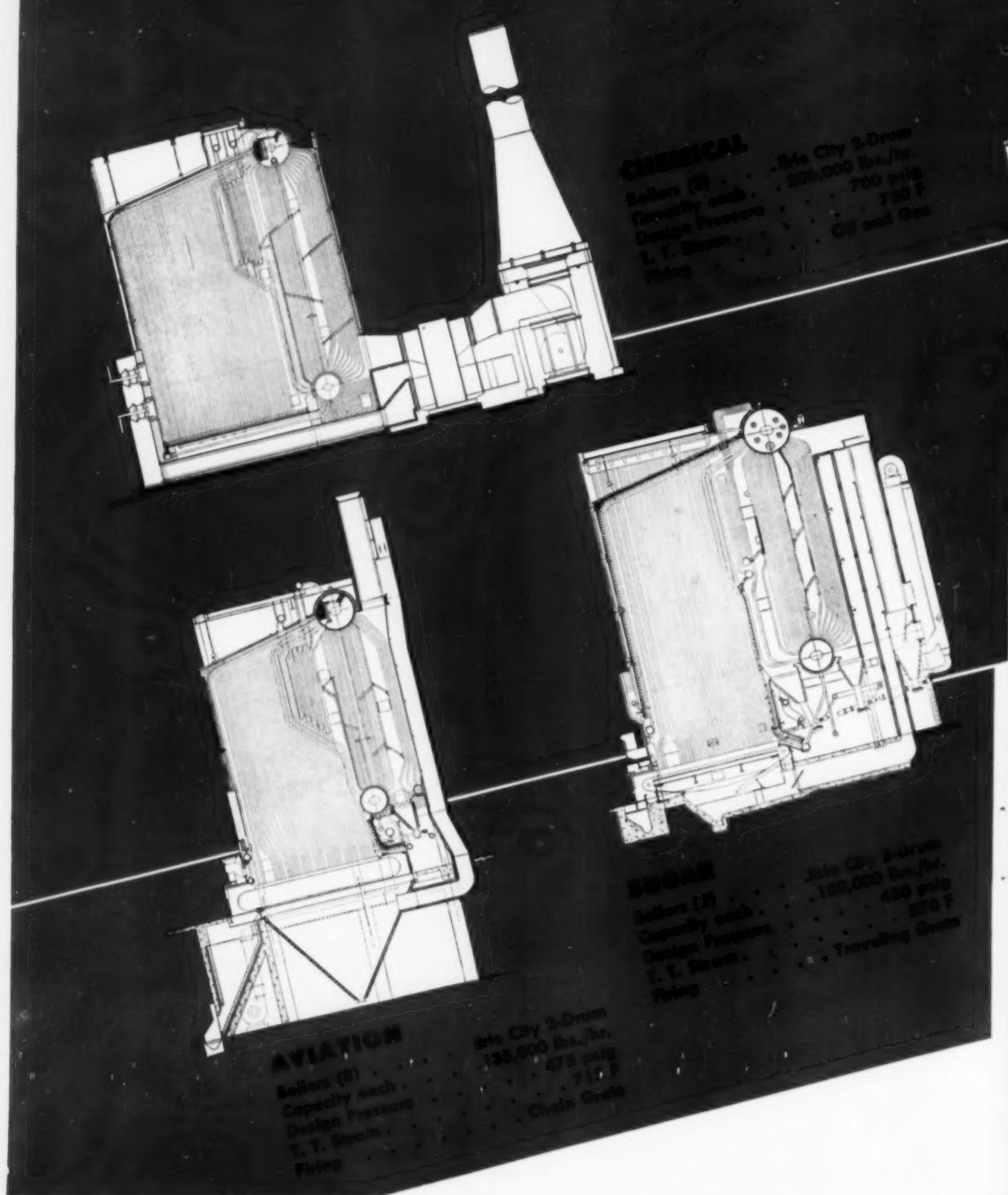


FALK . . . a good name
in industry

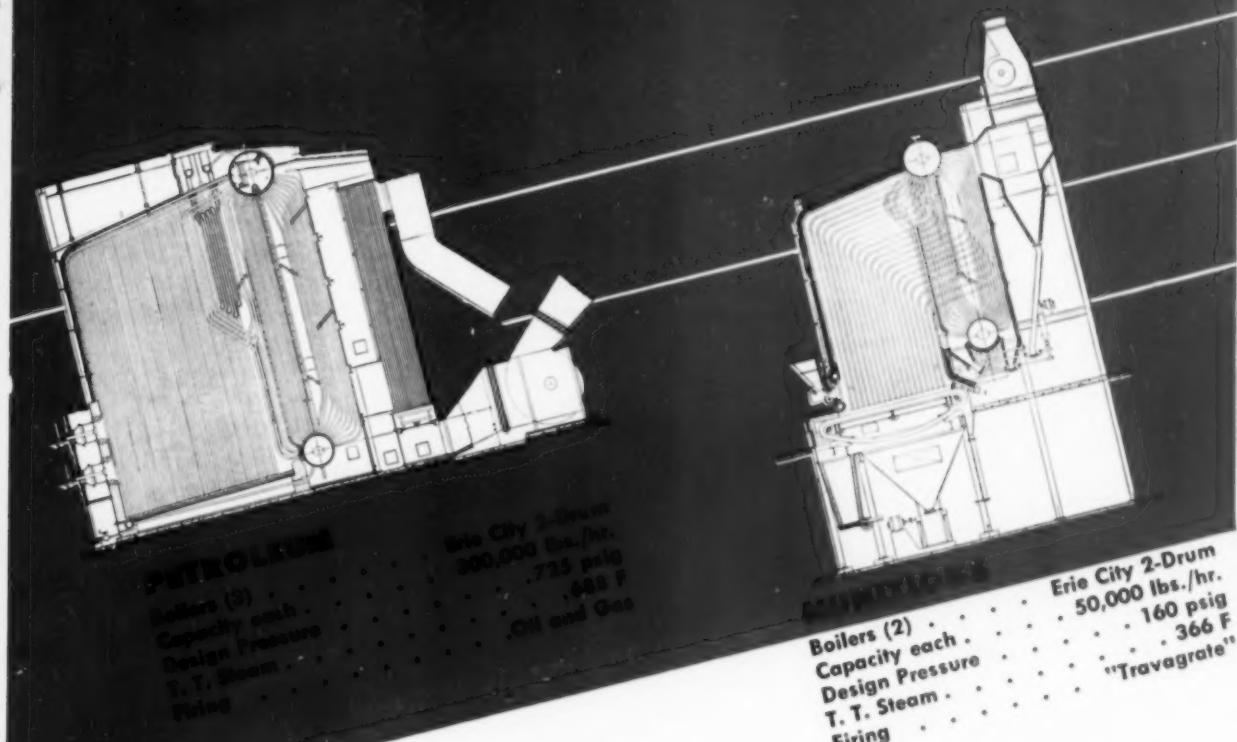
THE FALK CORPORATION • 3001 W. Canal St. • Milwaukee 8, Wis.

WRITE FOR BULLETIN 3104

The "New Look" in Erie



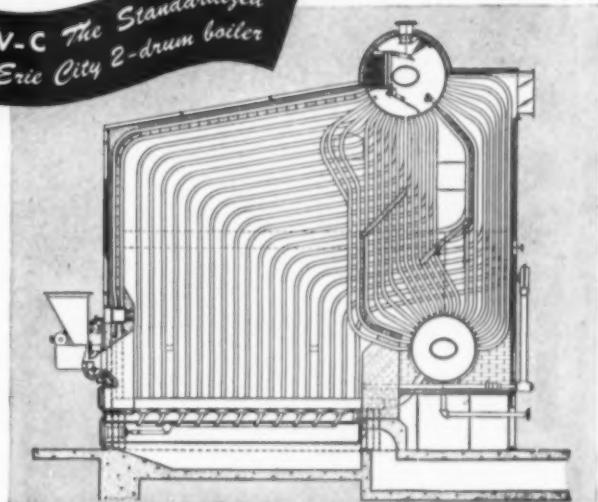
City 2-Drum Boilers



You can depend on Erie City for sound engineering

Hundreds of Erie City 2-Drum Boilers have been installed since 1909. Some recent and typical installations are shown here to indicate that we have set the pace in modern practice. Erie City custom built 2-drum steam generators are available to meet special conditions. For normal steam requirements we have developed the VC two drum line in standard types and many capacities for any firing method. Ask for Bulletin VC-6. Send your steam problem — our engineers are at your service.

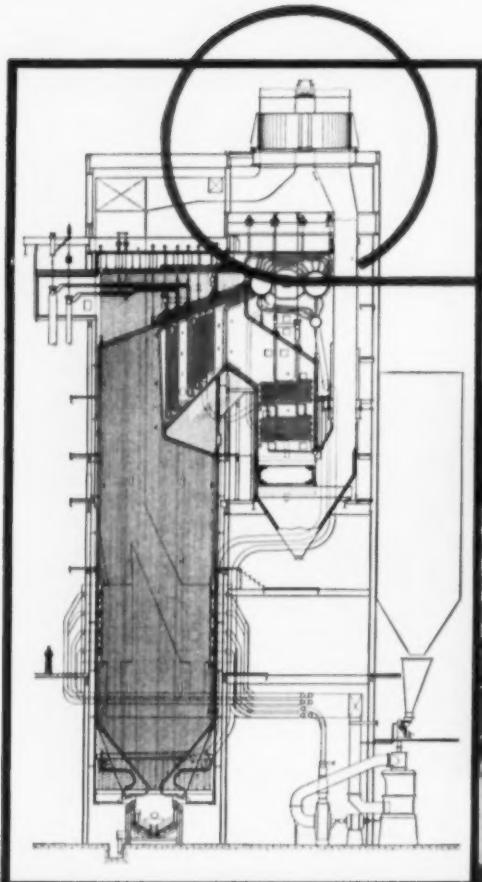
V-C The Standardized
Erie City 2-drum boiler



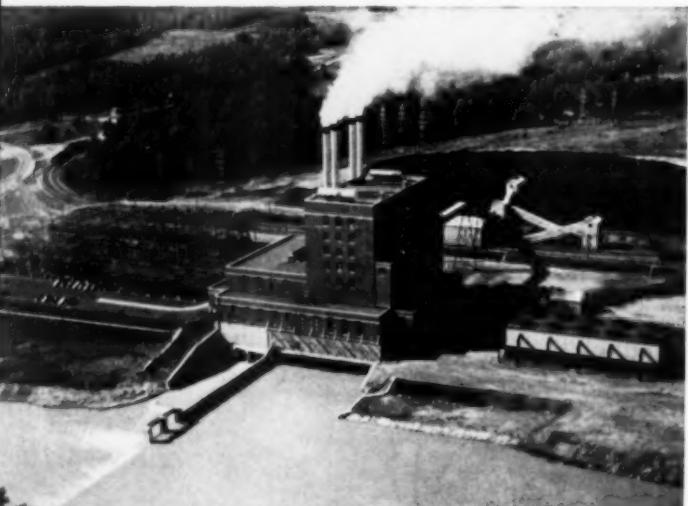
ERIE CITY IRON WORKS • Erie, Pa.
STEAM GENERATORS • SUPERHEATERS • ECONOMIZERS • AIR PREHEATERS
UNDERFEED AND SPREADER STOKERS • PULVERIZERS

All Reheat Boilers at New Lee Station of the Duke Power Company

equipped with



LJUNGSTROM AIR PREHEATERS



By mid-summer last year, both units of the first section of the Duke Power Company's new Lee Station had gone into service. Designed and built by Duke Power's own organization, Lee Station's 190,000 kilowatts help fill the growing power needs of industrialized South Carolina.

Each of the station's two 90,000/100,000-kw turbine-generators is powered by a boiler designed and built by Combustion Engineering—Superheater, Inc. These C-E Steam Generating Units are fired by pulverized coal, and furnish

steam at a throttle pressure of 1250 psi and 950 F, reheated to 950 F.

Two Ljungstrom Air Preheaters are used with each boiler. These Ljungstroms preheat combustion air to 620 F and cool exit gases to 310 F.

Lee Station is another example of the unanimity with which the Ljungstrom Air Preheater is accepted as a standard unit for high-efficiency steam generators. Since the war, Ljungstrom Air Preheaters have been specified for an hourly capacity of over 285,000,000 pounds of steam.

THE Air Preheater Corporation 60 East 42nd St., New York 17, N. Y.

how to provide
PROTECTION • PLUS



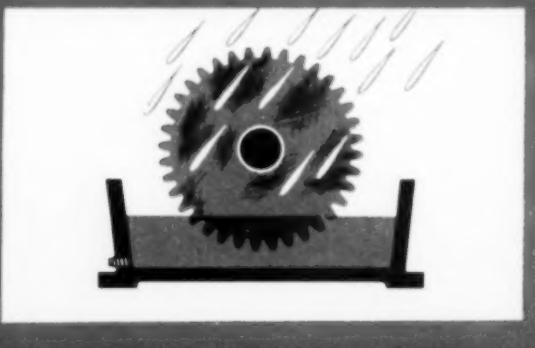
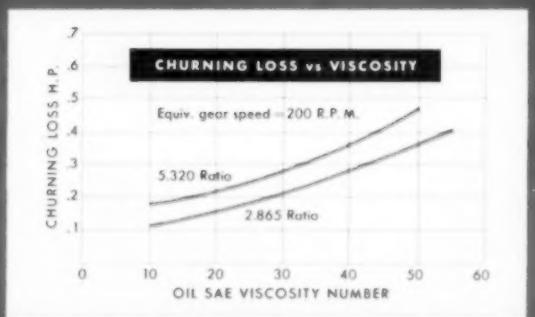
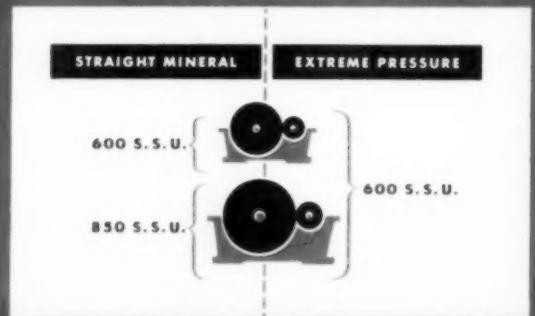
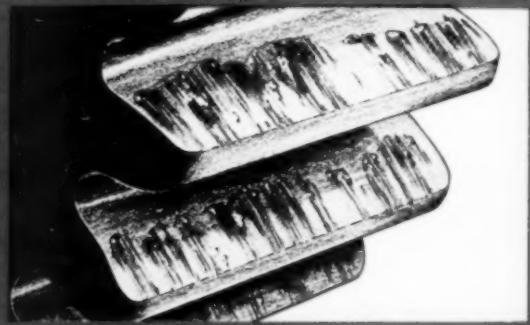
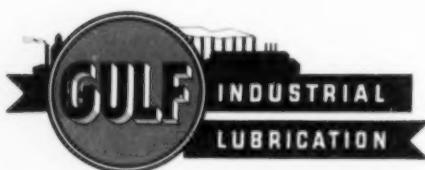
for enclosed
gear drives...

SWITCH TO GULF E.P. LUBRICANTS

... and save
maintenance dollars!

Gulf E. P. Lubricants combine all the properties that count in an extreme pressure lubricant: high film strength, excellent rust preventive properties, good water-separating characteristics, good stability, and they are noncorrosive, nonfoaming. Their use insures longer gear and bearing life and lower maintenance costs for gear drives under a wide range of operating conditions.

Gulf E. P. Lubricants are available in the proper viscosity for every gear requirement ranging from 55 to 1000 S.U.V at 210 deg. F. For specific recommendations for your equipment, call in a Gulf Sales Engineer today. Write, wire, or phone your nearest Gulf office or send the coupon on the last page.



Practical advantages of Gulf E. P. Lubricants:

More effective protection against tooth scoring and welding

Gulf E. P. Lubricants have proven ability to protect gear teeth against damage by scoring and welding. They are specially compounded to provide extra film strength and to prevent metal-to-metal contact under most conditions of overload and shock load.

That's why you can usually avoid tooth damage like that shown at the left when you use Gulf E. P. Lubricants. And that's why they provide an extra margin of protection when production demands approach or exceed the rated capacity of the equipment.

Fewer lubricant grades needed—lubricant storage and handling simplified

Because Gulf E. P. Lubricants have superior film strength, it is often feasible to use a lower viscosity grade than would be possible with a straight mineral oil. This is a practical advantage for plants operating several different types of gear drives. If, as

pictured at the left, two straight mineral oils of different viscosity are specified, one grade of Gulf E. P. Lubricant may well do the job of both. Thus lubricant storage and handling is simplified, and there is less chance for confusion in the oil house.

Reduced power loss caused by churning in splash-lubricated units—lower power costs

There is another advantage in using a lower viscosity oil in splash-lubricated units where power loss due to churning is appreciable. Since this loss is almost directly related to oil viscosity, the use of lighter

Gulf E. P. Lubricants often means reduced heat generation and lower power costs.

The chart at the left shows the effect of viscosity on the churning loss in horsepower of a typical gear unit.

Excellent protection against rust

The ability to protect polished gear teeth and antifriction bearings against rust is an important property of a gear lubricant, and is essential in a lubricant for units which are occasionally idle.

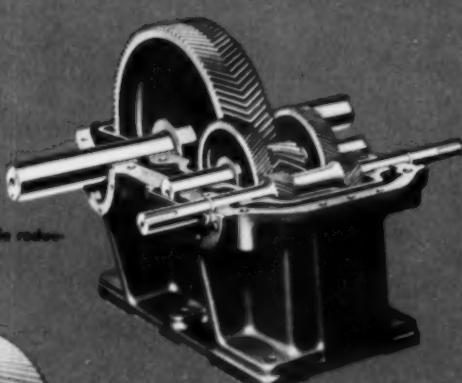
Gulf E. P. Lubricants have highly effective rust preventive properties—insure against excessive wear and enlarged tolerances which might result from the presence of abrasive rust particles.

other advantages

{ good water-separating characteristics
non-corrosive
non-foaming
stable for this type of lubricant

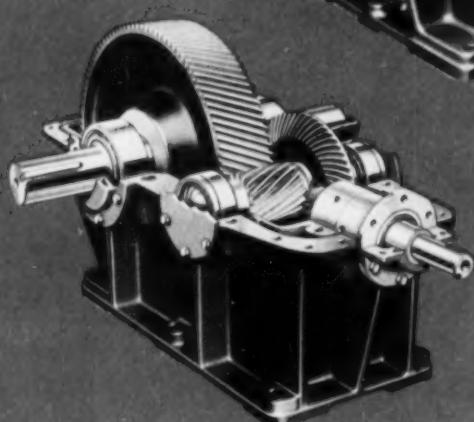
make Gulf E. P. Lubricants ideal for:

Parallel shaft double reduction unit (Falk)

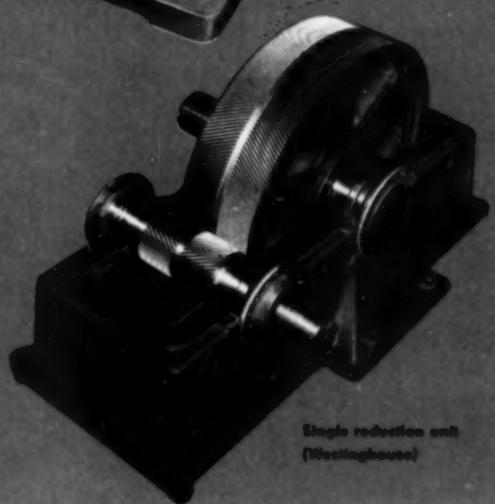


High speed, single reduction unit (Westinghouse)

Double reduction, right angle drive (Falk)



Single reduction unit (Westinghouse)



GULF OIL CORPORATION • GULF REFINING COMPANY
1822 Gulf Building, Pittsburgh 30, Pa.

Gentlemen:

- I would like further information on Gulf E.P. Lubricants:
 Please have a Gulf Sales Engineer call.
 Please send me a copy of your pamphlet "Gulf E.P. Lubricants for Reduction Gear Drives."
 Please arrange to show a group in our plant the new Gulf Color Slide Film, "Gears and Their Lubrication," Part I.

Name _____

Company _____

Title _____

Address _____



How to Figure the cost of STEAM TRAPS

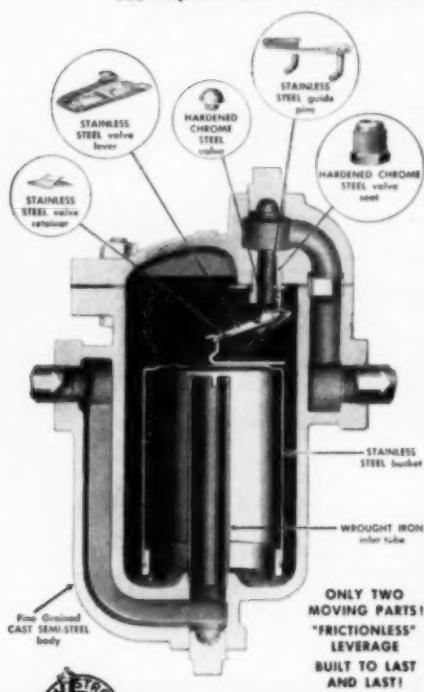
1. PRICE—you get a lot of trap for your money when you buy an Armstrong: big capacity in small size; the long-lasting mechanism in traps for low and medium pressures is identical in design, workmanship and materials, to that in traps for 900 degrees, 950 lbs. pressure!

2. INSTALLATION—Armstrong gives you a choice of body styles to save installation labor and pipe fittings.

3. MAINTENANCE—Armstrong traps last longer! You save labor, parts cost and downtime. Freedom from leakage saves fuel.

Divide total trap cost by the life of the trap to get costs per year—this is where Armstrong traps really shine. Call your Armstrong Representative for the traps you need now, or write:

ARMSTRONG MACHINE WORKS
806 Maple Street • Three Rivers, Michigan



Full Facts In FREE Catalog J

Catalog J, also an educational handbook on condensate drainage, gives sizes, prices and capacities of Armstrong traps. It tells how to select traps; how to make hook-ups; how to trouble-shoot. Send for a copy today.

ARMSTRONG TRAPS
Yes

ARMSTRONG STEAM TRAPS *cost less!*

**A real
advance
in steam
generation**



OIL, GAS
OR GAS-OIL
COMBINATION

KEWANEE-RAY BOILER - BURNER UNIT

Produce steam more economically, more efficiently, with the new Kewanee-Ray Boiler-Burner Unit. Use heavy catalytic residual fuel oils or light oils in combination with high or low pressure gas in a single unit!

New multi-stage, forced draft, secondary air control on the burner provides a constant velocity air stream to the combustion zone. Resulting high turbulence, high turn-down ratio and high CO₂ content give you high combustion efficiency.

Quickly Installed . . . Simple to Operate. Matching connections are provided so that when the boiler and burner are brought together they can be easily connected with a minimum of field effort. A flip of the switch and the unit goes to work on either oil or gas. To change fuels, flip the switch again. *That's all.* Fully automatic operation throughout.

The Kewanee-Ray Boiler-Burner Unit is complete. Boiler, burner, all automatic con-

trols and accessories as specified. No special foundation is required. All refractories are integrally mounted at the factory. And a built-in forced-draft fan eliminates need for high stacks.

For High or Low Pressure Steam or Hot Water Heating. High pressure units, for 1350 to 15,800 lbs. of steam per hour developing 39 to 456 horsepower at 125 and 150 psi. Low pressure units for 15 lb. steam or 30 lb. water rated at 1,313,000 to 15,300,000 btu.

The complete boiler is shipped from Kewanee, the burner including windbox and control panel from Ray...so each shipment can be timed to arrive when you want it. The boiler should be on the job site before the new plant walls are up. (Exposure to weather does no harm). The shipment of the burner can be delayed until the new building is enclosed. Arrival of unit in two separate shipments is another important advantage when Kewanee-Ray is specified.

RAY OIL BURNER COMPANY 1308 San Jose Avenue, San Francisco, California

KEWANEE-ROSS CORPORATION 109 Franklin Street, Kewanee, Illinois

Please send me your 16-page KR-1031 Catalog giving complete description and specifications on your Boiler-Burner Unit.

NAME _____

ADDRESS _____

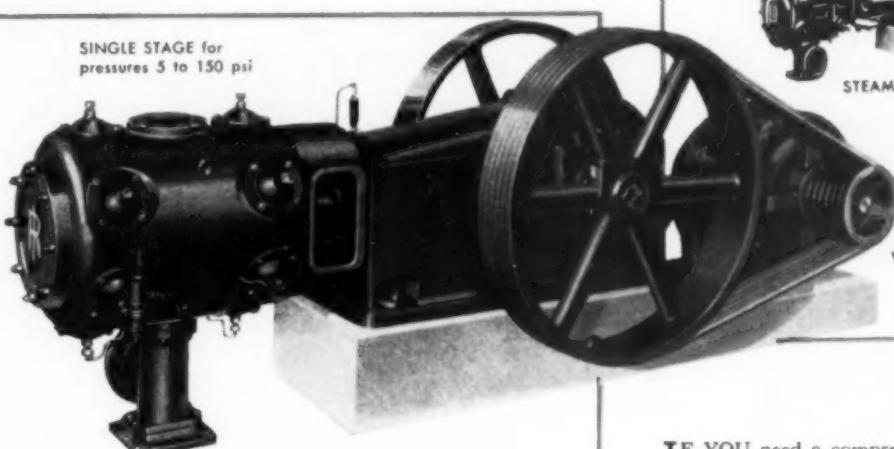
CITY _____ STATE _____

HEAVY-DUTY “ES” COMPRESSORS

**provide maximum efficiency in a
WIDE RANGE OF APPLICATIONS**

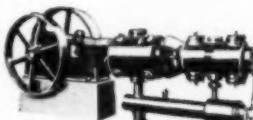
*...with unusual flexibility of
drive and cylinder arrangements*

SINGLE STAGE for
pressures 5 to 150 psi



STEAM DRIVE

V-BELT DRIVE



TWO STAGE for
150 to 500 psi



THREE STAGE for
500 to 2500 psi



DRY VACUUM PUMPS . . .
single or two stage



STEAM-PRESSURE BOOSTERS



NON-LUBRICATED CYLINDERS
for oil-free air or gas



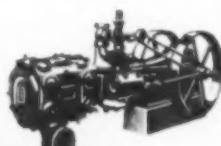
REFRIGERATION UNITS
for ammonia or other refrigerants



OVERHEAD MOTOR



DIRECT-CONNECTED
SYNCHRONOUS MOTOR



STEAM DRIVE

IF YOU need a compressor for any of the following purposes you should consider the Type “ES” compressor . . . a standardized, yet extremely flexible compressor built by Ingersoll-Rand, the pioneer compressor builder.

- To compress air or gas to any pressures between 5 and 2500 psi, or for pulling vacuums. (Stock cylinders are normally available for all frame sizes, see illustrations.)
- For capacities requiring from 5 to 125 horsepower. (Six frame sizes are available.)
- For continuous full-load operation day after day, week after week.
- For handling poisonous, inflammable, or other gases where leakage must be avoided.
- Where compressed air or gases must be free of all traces of oil. (Type NL cylinders require no oil, glycerine, grease or water for lubrication.)
- Where a future change in pressure conditions may call for a change in cylinder sizes.
- Where power cost is an important factor.
- To act as an economical standby unit for larger compressors whose full capacity is not required at all times.



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SOUTHERN POWER & INDUSTRY for SEPTEMBER, 1953



any way you look at it...



Superwashed COALS ARE BEST!

From any angle, Bell & Zoller's *Superwashed* ORIOLE coal is a top performer in keeping boiler efficiency up . . . steam costs down. Scientifically cleaned and correctly sized to meet your specific requirements—and shipped from the No. 11 seam in Western Kentucky via rail or economical combined rail-inland waterway routes.



BELL & ZOLLER COAL COMPANY

Bell Building • Chicago 1, Illinois

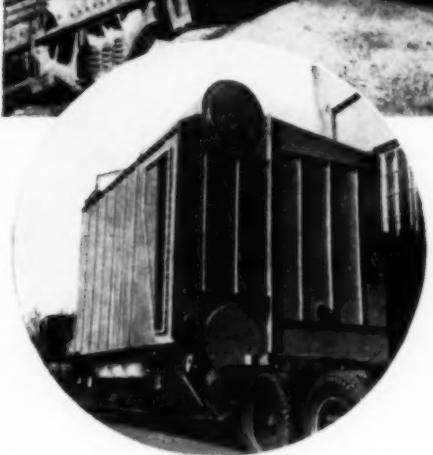
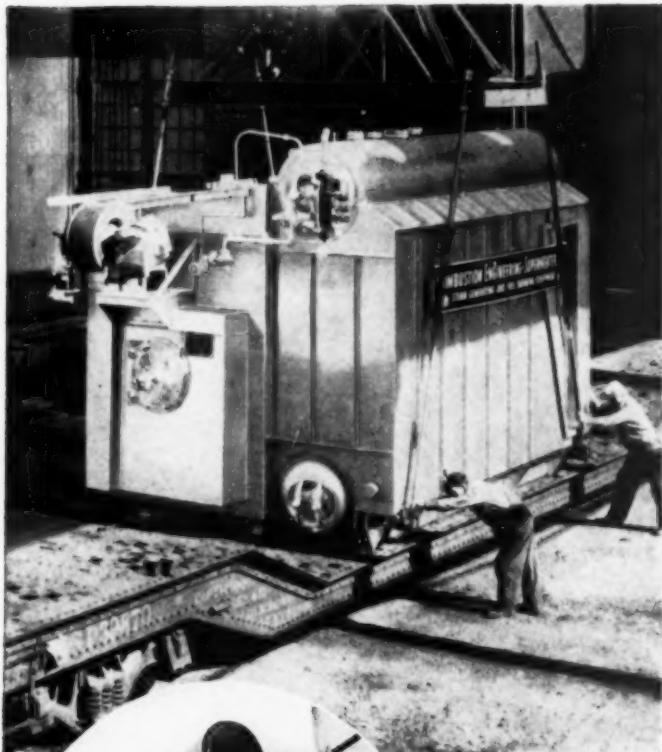
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Spring Hill • Vesta Red Ash



SIXTY-SEVEN YEARS OF SERVICE TO COAL USERS • ST. LOUIS • LOUISVILLE • OMAHA • MINNEAPOLIS • TERRE HAUTE

Don't settle for just A Package Boiler

INVESTIGATE THE VP BOILER



VP Boilers are available in capacities from 4,000 to 30,000 lb of steam per hr; pressures to 250 psi. Send for Bulletin VP-142

...the Package Boiler

with

EXTRA
features

If you're in the market for a Package Boiler, here's the problem you face. There are a number of water-tube package boilers being offered today. Most of them look pretty much alike. And, in some respects, they are alike.

But you're looking for the "best buy" in a package boiler. Therefore your interest lies in points of difference rather than points of similarity. The C-E Package Boiler, Type VP, offers all the better design features of its contemporaries *plus* the following extra features:

1. **Fully Water Cooled Furnace** — More cooling area per cubic foot of furnace volume than any other boiler of the VP's size and type. In all but the three smallest sizes, the VP Boiler has water-cooled walls on *all six sides* of the furnace—including the burner wall.
2. **Larger Lower Drum** — The 30-in. diameter lower drum permits a simple, symmetrical tube arrangement... provides easy access for washing down or inspection... its greater water storage capacity facilitates the handling of fluctuating loads.
3. **Centrifugal Fan** — This more efficient type of fan operates at lower speed than other types and is quiet in operation. In fact, its average noise level is less than half that of typical high-speed fans used on most package boilers.
4. **Simple Baffle Arrangement** — Minimum changes in direction of gas flow—no baffle at all in convection bank of larger VP Boilers. This means lower draft loss... simplified soot blowing... absence of dead pockets, thus, maximum heat pick-up. In the intermediate sizes, a water-cooled baffle assures minimum maintenance.



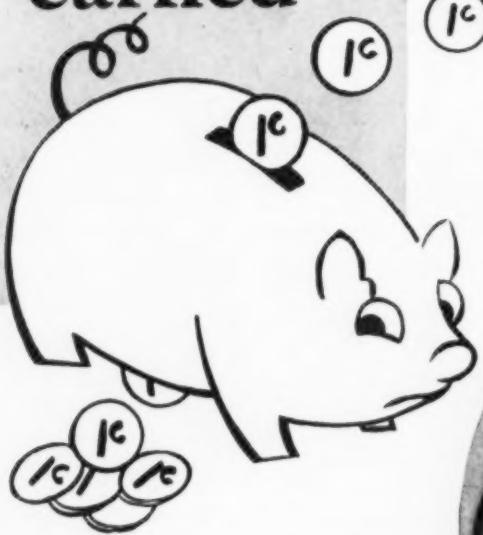
B-673A

COMBUSTION ENGINEERING, Inc.

Combustion Engineering Building • 200 Madison Avenue, New York 16, N. Y.

ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT

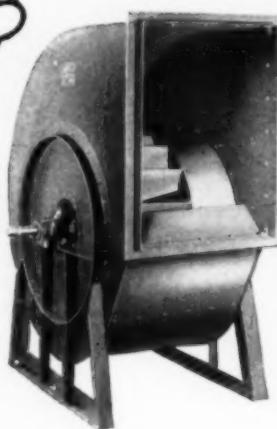
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VENTILATING FANS —

Complete lines, the Jubilee Breezo, an efficient disk fan—the "LL", a non-overloading centrifugal, the Axial Flow, and many others for all services including forced and induced draft fans.

"Buffalo" Engineering Sales Representatives in all principal cities are anxious to work with you. Call on them for advice without obligation.



AIR CONDITIONING AND CLEANING EQUIPMENT —

Full lines of industrial air cleaning equipment for gases and fumes, as well as air washers and cabinets for air conditioning.

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PUBLISHERS OF "FAN ENGINEERING" HANDBOOK

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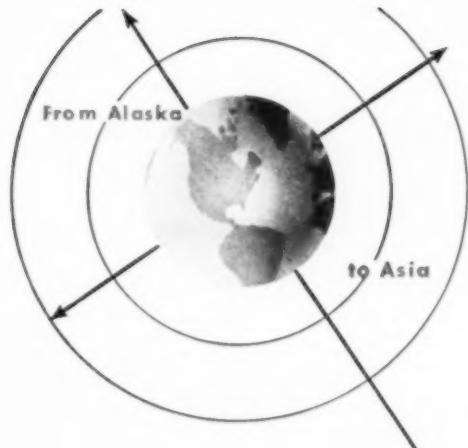
VENTILATING
FORCED DRAFT

AIR CLEANING
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AIR TEMPERING
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INDUCED DRAFT
PRESSURE BLOWING

EXHAUSTING



Powermaster®

**is a
world-wide choice
for**

LOW-COST STEAM

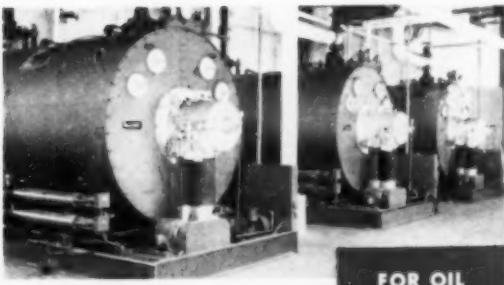
All over America—in U.S. Possessions...in Canada...South America...Europe...Asia...Africa—thousands of *Powermaster* Packaged Automatic Boilers are now supplying steam and hot water requirements—with outstanding reliability and economy for:

bakeries • beverage plants • canners and food processors • chemical plants • dairies • dry cleaners • hospitals and institutions • hotels • apartment and office buildings • laundries • meat packers • public schools and colleges • tanneries • textile mills • tire and rubber companies • paper mills • railroad shops • manufacturing plants • and many other users.

A large percentage of present users have ordered additional *Powermaster* units...and the list of new *Powermaster* users is getting longer every day.

HERE'S WHY—Ease and economy of installation—space-saving compactness—fuel-saving smokeless VORIFLOW combustion—highly efficient operation at all loads—maintenance-saving accessibility—forced draft—full-range automatic modulating firing control—completely automatic operating and safety controls—these are some of the reasons for the steadily growing universal preference for *Powermaster*.

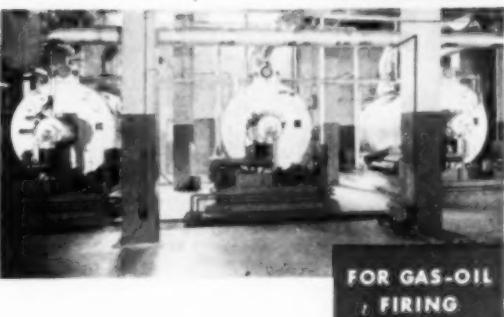
*If selecting, installing, or operating boilers is your business, you'll want the complete story of *Powermaster* cost-saving advantages contained in this new bulletin.*



FOR OIL
FIRING



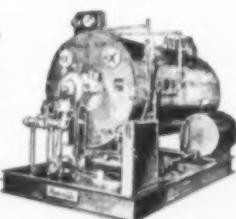
FOR GAS
FIRING



FOR GAS-OIL
FIRING

Powermaster®
PACKAGED AUTOMATIC BOILERS

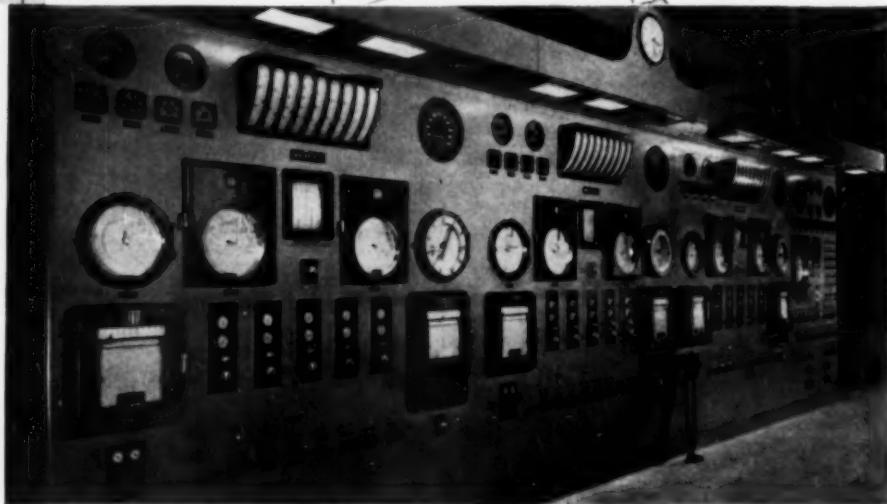
In sizes to 500 HP; pressures to 250 psi.



ORR & SEMBOWER, INC. • Established 1885 • 910 Morgantown Road, Reading, Penna.



All three boilers are checked and controlled from this master control panel which contains Republic gauges, recorders, continuous integrators, manual-automatic transfer sub-panels and biasing sub-panels for adjusting oil-air ratio.



From war-wrecked power facilities in 1945 to modern equipment with a generating capacity of over 140,000 kw today is the rehabilitation achievement of which Manila Electric Company can be proud. Typical of the modern equipment now operating is this new 50,000 kw power station. Designed by Gilbert Associates, Inc., it contains three oil-fired boilers, each rated at 250,000 lbs. per hr. at 875 psig and 910° F. To maintain the operation of these boilers at maximum efficiency under all load conditions, Republic Automatic Combustion Controls have been installed. Pressure reducing valves and controls plus feedwater pump controls were also furnished by Republic.

This is but one example of power stations all over the world that are equipped with Republic Combustion Controls. Recent over-seas installations include stations in Italy, Greece, Chile, India and Australia.

Wherever the station, whatever the fuel, draft arrangements or load characteristic, Republic Combustion Controls can operate boilers to hold fuel and air in the correct amounts and proportion for maximum combustion efficiency.

Get the details in Data Book S-21 or contact your nearby Republic field engineer.

REPUBLIC FLOW METERS CO.

• 2240 DIVERSEY PARKWAY • CHICAGO 47, ILLINOIS

NOW- BIG NEWS

IN THE POWER AND
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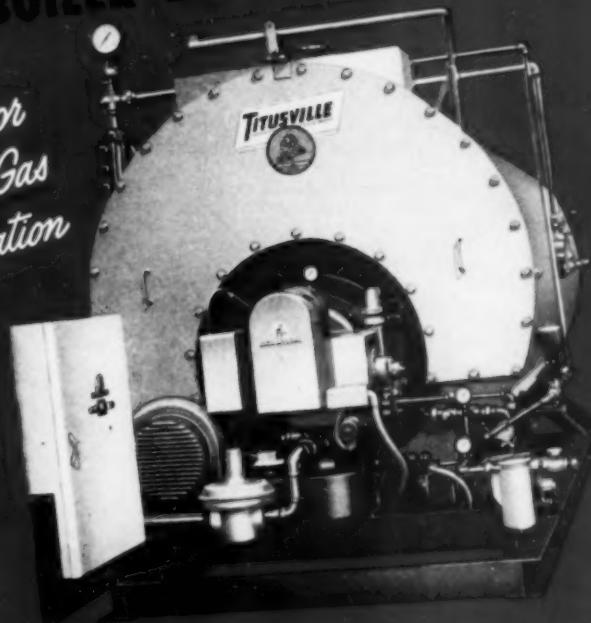
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for YOU!

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Oil, Gas or
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From steam flow—air flow, or by the fuel air ratio method. Designed especially for the most modern central station boilers, but well suited for smaller units.

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From three, two or one influences. Instrument or mechanical types to meet all operating conditions or preferences. Adaptable to all piping layouts.

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Multi-element type. Through burner or damper positioning, gas recirculating,

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SOOT BLOWER CONTROL

May be full automatic-sequential control or individual push buttons. Each step in the blowing cycle can be reported back to the panel by signal or program lights.

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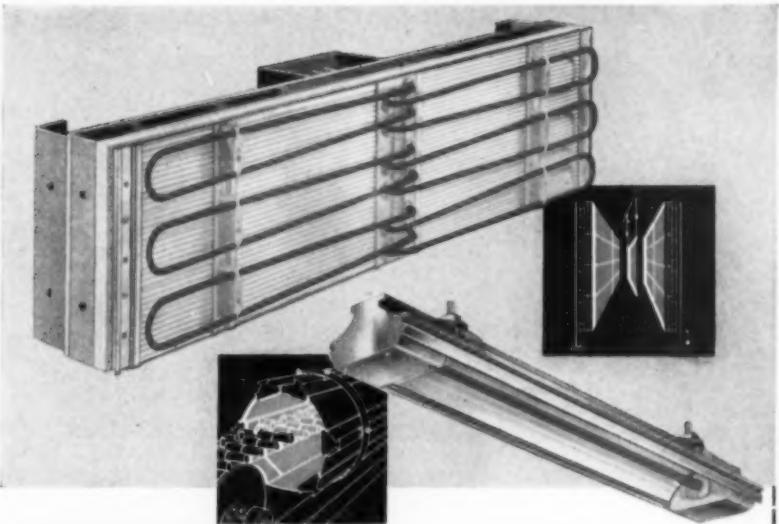
Miniature instruments, especially with auto-manual selector valves, are ideal for modern space-saving and graphic panels. Standard size instruments also available.

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ASK FOR BULLETIN 1007



BOILER CONTROLS



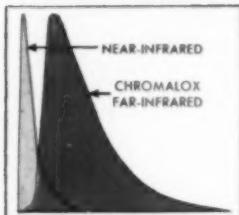
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Far-infrared

solves hundreds of heating problems

Here's your quick, economical and easy solution for curing, drying, degreasing, dehydrating, baking and other heating jobs. Pre-engineered Chromalox Units make oven building as simple as A-B-C, generate uniformly absorbed far-infrared heat for a multiplicity of processing needs. Temperatures up to 700° F. are easily selected, accurately maintained. Low initial cost, low write-off cost, low operating cost!

ONLY CHROMALOX GIVES YOU ALL THESE ADVANTAGES



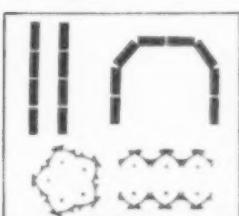
Color Blind Radiation

Longer far-infrared wave lengths are absorbed efficiently by all colors and textures.



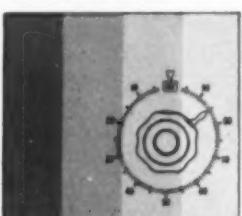
Heat Without Hot or Cold Spots

Chromalox radiant energy goes to work in a uniform pattern to span widest conveyor.



Low-Cost Oven Assembly

Pre-engineered Chromalox units require minimum expense to erect into complete ovens.



Infinitely Variable Heat Output

Heat from 0 to 100% of capacity to fit the exact temperature needs of the work.

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Electric Heat FOR MODERN INDUSTRY

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SOUTHERN POWER & INDUSTRY for SEPTEMBER, 1953

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available to you on

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ABRASIVES

- R-111: Drying Silicon Carbide Discs
- R-122: Drying Abrasive Cloth

ASPHALT

- L-1055: Melting Korite Sealing Compound
- R-105: Heating Asphalt to Improve Sealing of Batteries
- RP-203: Drying Asphalt Tile

AUTOMOTIVE

- R-126: Drying Tractor Parts
- R-118: Baking Synthetic Enamel on Gasoline Engines
Also see: Paint Baking

BATTERY

- R-105: Heating Asphalt to Improve Sealing of Batteries

BOTTLING (see Glass)

CERAMICS

- R-115: Drying a Water-Base Glaze on Ceramic Tile
- R-134: Preheating Dinnerware to Prevent Warping
- R-137: Drying Pottery

CHEMICALS (see Plastics)

COMFORT HEATING

- L-1077: Keep Men Warm, Keep Work on Schedule
- R-114: Comfort Heating for a Foundry Worker

DEGREASING

- R-116: Vaporizing Oil from Sheet Metal Parts

Also see: Paint Baking

DRUGS (see Glass)

ELECTRONICS

- R-109: Drying Cement Base in Television Tubes

FINISHES (see Paint Baking, Degreasing)

FOUNDRY

- L-1060: Skin Drying of Molds
- L-1085: Core Drying
- L-1096: Shell Molding Goes Automatic
- R-115: Comfort Heating for The Foundry Worker
- R-130: Drying Precision Plaster Molds
- R-133: Shell Molding

GLASS

- C & R-2: Sterilizing & Preheating Bottles
- R-127: Heating Television Tubes to Bake Interior Graphite Coating

PAINT BAKING

- L-1064: Drying Lacquered Metal Parts
- L-1065: Improves Enamel Baking Five Ways
- L-1066: Bakes Big Parts or Small, Fast or Slow
- L-1080: Baking Paint on Radiators
- R-118: Baking Synthetic Enamel on Gasoline Engines
- R-119: Baking Paint on Metal Awnings
- R-131: Baking Paint on Meter Parts
- R-138: Drying Ink and Paint on Toothpaste Tubes

PAPER

- R-134: Drying Glued Paper Sheeting

PLASTICS

- L-1086: Drying Vinyl Coating on Imitation Leather
- L-1097: Post-Forming Formica
- R-101: Molding Kapok Center for Softballs
- R-102: Drying Plastic Powders
- R-104: Preheating Microta Strips for Punching
- R-121: Dehydrating Vinyl Sheets
- R-123: Drying Plastic Laminates
- R-128: Curing Plastic Coating on Spring Clips
- R-129: Fusing Vinyl to Chip Board
- R-132: Embossing Vinyl
- RP-120: Heating Plexiglas for Vacuum Forming
- RP-202: Heating Thermoplastic for Vacuum Forming

PRINTING

- L-1090: Silk Screen Process Drying
- R-103: Static Removal
- R-107: Drying Ink on a Malleable Vertical Press
- R-108: Ink Drying on 8-Unit Web-Fed Offset Press
- R-110: Eliminating "Offset" on Duplicating Machines
- R-124: Drying Ink on a Goss Press
- R-136: Silk Screen Process Drying

REFRIGERATION

- L-1055: Dehydrating Refrigerator Coils

RESTAURANT

- For-Infrared Food Warmer

RUBBER

- L-1056: Curing Latex Foam Sponge Rubber
- R-125: Cementing Crepe Rubber to Wooden Soles

TEXTILES

- L-1068: Fusing Vinyl to Cloth Work Gloves
- R-112: Dehydrating Braiding Material

EDWIN L. WIEGAND CO., Radiant Heating Div.,
7563 Thomas Blvd., Pittsburgh 8, Pa.

- Send me application reports I have checked.
- Have a Chromalox Application Engineer get in touch with me.

Name _____

Company _____

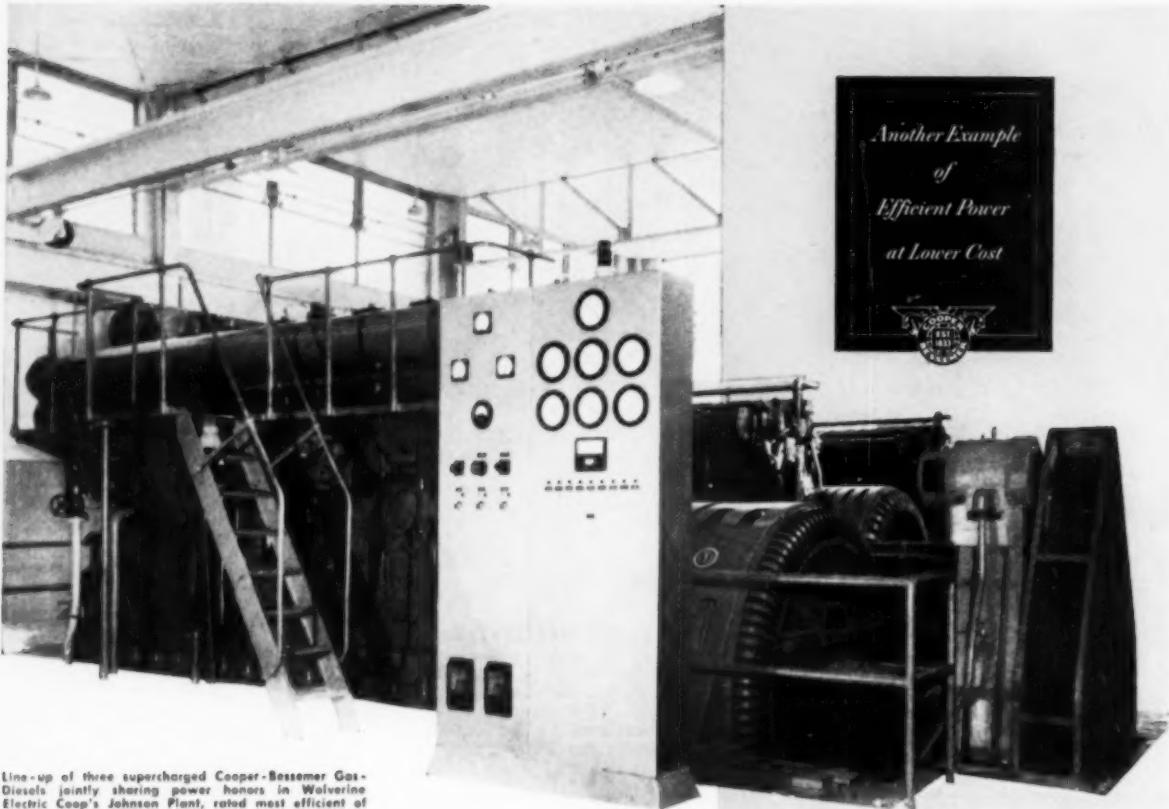
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(IC-71)



Line-up of three supercharged Cooper-Bessemer Gas-Diesels jointly sharing power honors in Wolverine Electric Coop's Johnson Plant, rated most efficient of all R.E.A. internal combustion plants in DIESEL PROGRESS annual award.

IT'S COOPER-BESSEMER, 4 OUT OF 5

in the nation's most efficient R.E.A. plants!

- Listed opposite, in the order of their standing, are the five R.E.A. plants cited for the highest operating efficiency during 1952.

Needless to say, it is a matter of pride and satisfaction to us that Cooper-Bessemer engines have contributed to the championship performance of the four highest rated plants. This year, credit for powering the top award plant is jointly shared by Cooper-Bessemer. Of the remaining four plants the three next in order are exclusively Cooper-Bessemer powered.

This is the second annual award . . . and the second time Cooper-Bessemer engines have come in for *top* honors. It's mighty strong evidence that you just can't beat Cooper-Bessemers for holding efficiency up and costs down!

*Another Example
of
Efficient Power
at Lower Cost*



★ **WOLVERINE ELECTRIC COOP.**
Johnson Plant, Hersey, Michigan
Net KWH 27,932,458
Adjusted net power cost... 6.85 mills per KWH

★ **M & A ELECTRIC POWER COOP.**
Green Forest Plant, Poplar Bluff, Mo.
Net KWH 24,708,960
Adjusted net power cost... 7.16 mills per KWH

★ **WESTERN MINNESOTA POWER COOP.**
Benson Plant, Benson, Minn.
Net KWH 13,992,000
Adjusted net power cost... 7.20 mills per KWH

★ **THUMB ELECTRIC COOP. OF MICH.**
Huron Plant, Clio, Mich.
Net KWH 11,580,700
Adjusted net power cost... 7.71 mills per KWH

★ **WESTERN FARMERS ELECTRIC COOP.**
Comanche Plant, Woodward, Okla.
Net KWH 13,408,400
Adjusted net power cost... 7.73 mills per KWH

★ **Cooper-Bessemer power**

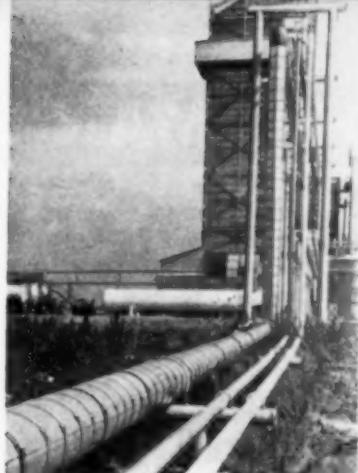
The
Cooper-Bessemer
Corporation

MOUNT VERNON, OHIO — GROVE CITY, PENNA.

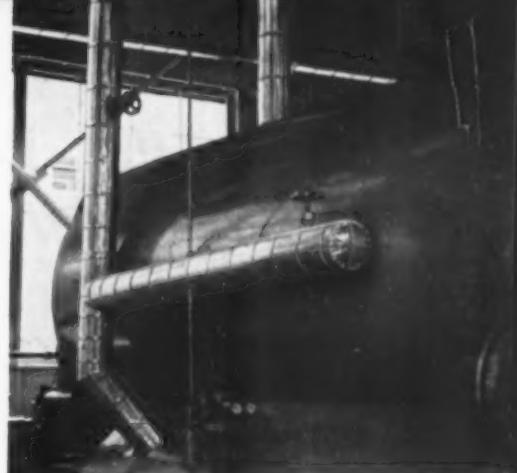
New York Washington, D.C. Bradford, Pa. San Francisco Houston,
Dallas, Greggton, Pampa and Odessa, Texas Seattle Shreveport
St. Louis Los Angeles Chicago Cooper-Bessemer of Canada, Ltd.,
Halifax, Nova Scotia Tulsa Gloucester, Mass. New Orleans, La.



This big new Oklahoma refinery has used a new kind of aluminum jacketing throughout on both insulated lines and towers and vessels. Light in weight and low in cost, this new Childers Aluminum Jacketing cut installation costs. It is also expected to cut maintenance costs.

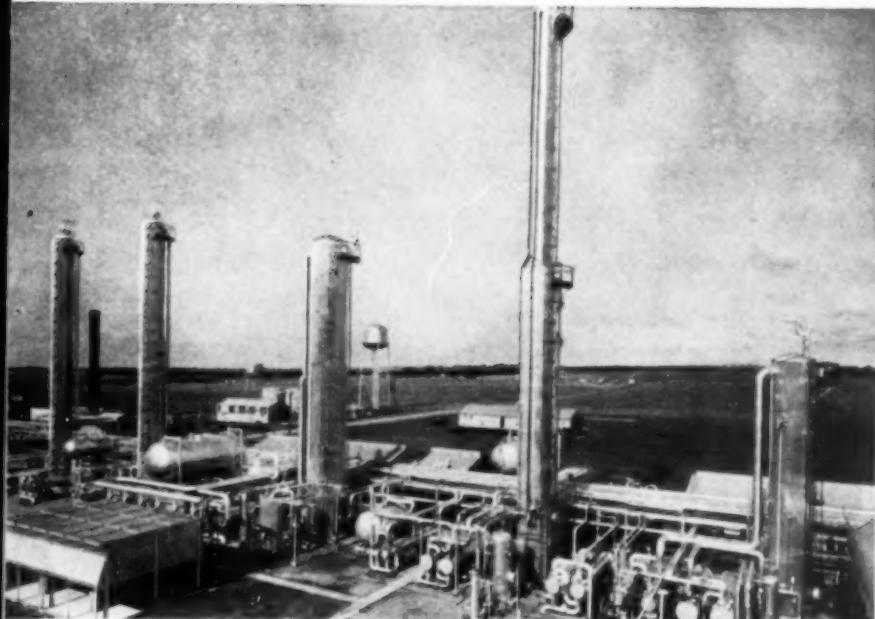


Childers Aluminum Jacketing is used here on a cross-country transfer line at a large chemical manufacturing plant in Texas. This is a rugged test for any jacketing, but the light-weight aluminum used in this jacketing should stand up to weather and chemical corrosion it encounters.



"Good Housekeeping" is the word in this gas pipeline pump station. The insulated lines are handsomely protected by Childers Aluminum Jacketing, which should last as long as the plant itself. The jacketing requires no painting and very little other maintenance. It even allows the interior of the plant to be washed with a hose without harm to the insulation. The chief engineer reports: "We have standardized on Childers Jacketing for all our insulated lines. It is doing an excellent job for us and saving us money."

How 5 plants cut costs of jacketing insulated lines



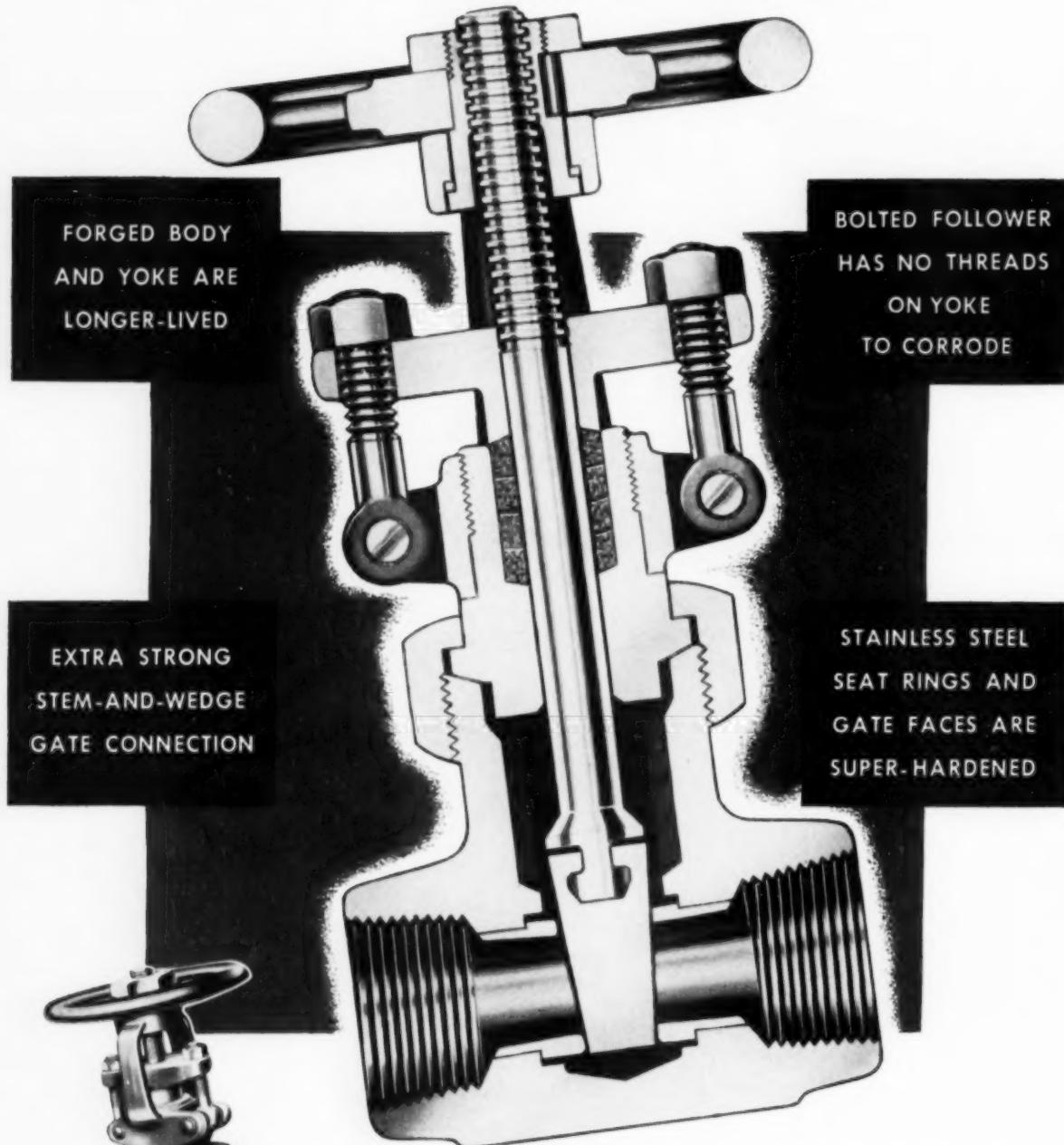
Weather, wind and corrosive gases are not going to attack the insulation of this new plains-country gasoline plant. The insulation is protected by long-lasting aluminum: Childers Aluminum Weatherproof Jacketing. The management expects this low-cost jacketing to hold insulation maintenance costs to a minimum. Other advantages are that the jacketing went on

quick and easy during construction; it required no special tools or skill—no shop forming or cutting. It can be taken off and re-used if lines are moved. Aluminum saves on painting and the tough 35 alloy used for Childers Jacketing should stand up for years even in highly corrosive industrial atmospheres. Check the advantages of this jacketing for your own plant.



Amazingly easy to handle, Childers Jacketing was applied here by men using no more than a wooden wedge and a pair of pliers. Childers has engineering representatives in every major industrial center who will be glad to confer with you on your particular jacketing problems. Write to address shown above.

Here's where **CHAPMAN LIST 960...**
gets all that Extra Strength



These hyper-husky, small forged carbon or alloy steel gate valves come in sizes from $\frac{1}{4}$ " to 2" inclusive... with choice of rising stem with yoke (shown), or with inside screw . . . and with choice of bonnet joints either gasketed or metal-to-metal. Pressure range: 2,000 lb. at 100°F. — 380 lb. at 1,000°F . . . if any higher, specify List 990. Send for Catalog 10.

The Chapman Valve Mfg. Co.

INDIAN ORCHARD, MASSACHUSETTS

Timely Comments



Handling of Bulk Materials

Trend to automation solving the problem of high accuracy at higher output.

SIGNIFICANT developments in recent months point to a trend to automation in the handling of bulk materials, particularly in the weighing of bulk materials.

According to President I. H. Richardson, Richardson Scale Co., Clifton, N. J., who spoke at the recent semi-annual meeting of the American Society of Mechanical Engineers, management in such diverse fields as glass manufacture, feed-milling, foundry-sand preparation, pre-mixed cements, rubber compounding and chemical and food processing is beginning to accept a highly advanced degree of remote automatic weighing and materials handling without doubting its practicality.

The particular problem of materials handling in these industries is simple: How to weigh out and mix ingredients by the hundred-pound or ton according to a prescribed formula as fast and as accurate as a housewife mixes ingredients for a cake. At times, though, the problem of proportioning may be even more complicated for the engineer than the housewife.

For example, he may have to mix as many as 43 products, in the case of rubber compounding, instead of, say, five or six. He may have to turn out as many as 40 batches an hour instead of just one or two mixings. And then again, he may have to change his recipe every time he turns out a new batch.

In spite of the added complexities, right now most proportioning and bulk handling operations are carried out in almost a household manner. Besides being costly and relatively slow, such systems are simply not productive enough to meet today's increasing demands for higher accuracies.

Few people, says Richardson, realize that products like corn meal, gluten feed, brewers

grain, alfalfa meal, fishmeal and ground oats are required to meet rigid formulas prescribed by chemists working with feed millers.

Automation is solving the problem of high accuracy at higher output. Automatic plants turning out hundreds of tons of formula-mixed product each day are not only possible, but are already a fact.

Richardson pointed to several plants, representing widely varying industries, where these new methods of handling bulk materials have recently been adopted.

One of the first plants to install automatic bulk handling and weighing equipment was the Stickell feed mill in Hagerstown, Md. Here 14 ingredients are delivered in prescribed quantities at timed intervals to alternate batch mixers. An individual automatic scale weighs out each ingredient in batches ranging from 50 to 150 lb, according to a setting on a panel board. Each scale weighs out the same weight, and delivers from 1 to 12 such weighings. The unit weighing becomes a common denominator, and formulas are arranged accordingly.

All scales at this installation are interlocked; loaded scales will discharge only when they are in correct balance. Colored lights show the progress of the batch from beginning to end. An electric stop counter records the number of completed batches and automatically shuts down the system after the required tonnage is reached.

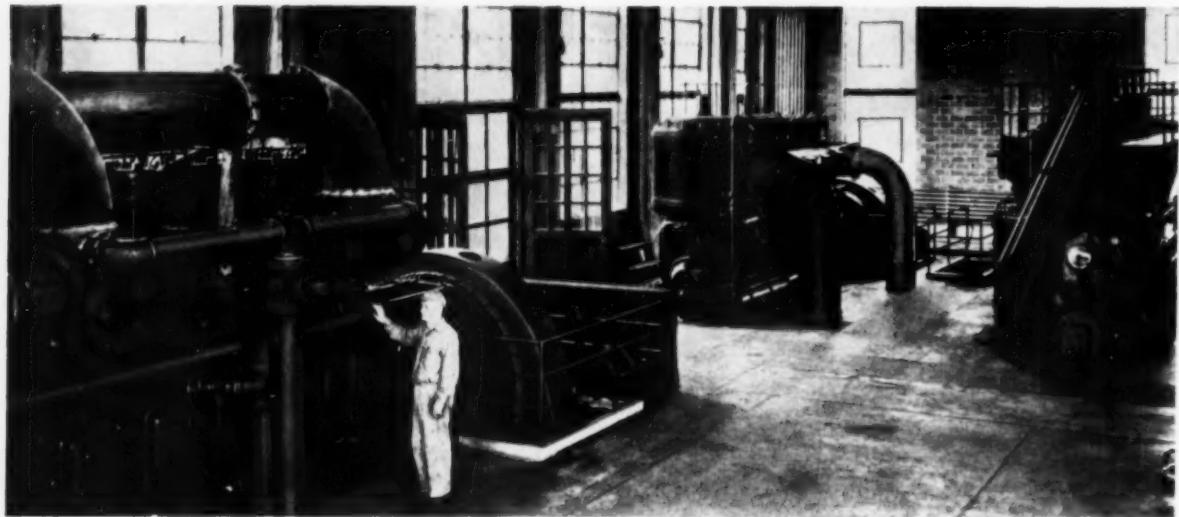
This system still requires the panel operator to select certain scales and establish the number of weighings of each for a given formula, and there is always the possibility of human error. This danger increases as the formulation becomes more complex, so the next step will involve the use of punched cards or templates, one for each formula, whereby all selection becomes automatic.

Pioneering in the development of automatic weighing and proportioning equipment, engineers at Richardson Scale Co. have designed the bulk handling systems at the plant mentioned. Chiefly responsible for the automatic control is the Richardson Select-O-Weigh system. The system worked out the problem of remote weight setting, remote-control bulk handling, and an economic method of cumulative weighing.

"It is safe to conclude that with such marked success in so short a time, this trend to automatic bulk handling will continue." Strangely, Richardson mentioned, the problems of mechanical and electronic automation are a lot simpler than the problem of convincing many potential users of the applicability of automation to his process.

H. L. Ostness, Chief Engineer, River Falls Municipal Utility, Wisconsin, says...

"Sticking Rings are no problem in this Plant"



Mr. Ostness, as chief engineer of one of the oldest Municipal Power Plants in Wisconsin, knows diesels — *knows how to get the most out of them*.

Mr. Ostness recently wrote, "We have used Sinclair Lubricants for over fifteen years very successfully. GASCON® and RUBILENE® H.D. have been doing an outstanding job in our diesels. Stuck rings is a trouble we know nothing about — engine wear is at an absolute minimum. With results like these, we'd recommend Sinclair Lubricants any time."

If your present lubricants do less, why not let Sinclair help you get longer life from your diesels — with less trouble. Contact your nearest Sinclair Representative or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.

SINCLAIR DIESEL LUBRICANTS

save wear and replacement

Industry Speaks

SOUTHERN POWER
AND INDUSTRY

Progress in the South; Problems Ahead

Adapted from comments by Don Ande, Acting Manager, Warehouse Division, Jones & Laughlin Steel Corporation, before the Nashville Rotary Club, Nashville, Tennessee. Jones & Laughlin recently opened a modern steel warehouse in Nashville.

INDUSTRIALIZATION is coming late to the fourteen Southern states and their 40 million people. Your rivers and your atmosphere are comparatively free of pollution. Your countryside is not as blighted as some of the northern landscapes I have seen. You are in a position to profit by our experience, to learn from our mistakes, and to avoid the industrial mess we made in the past century and are still cleaning up. The country is watching to see whether you can combine the material advantages of speedy industrialization with the spiritual assets of an older agrarian culture, and at the same time preserve the natural physical assets of your region. The indications are that you are going to do it.

We are all impressed with what you have been doing here in the past decade. I think Fortune magazine echoed our thoughts recently when it wrote: "For the first time in a century the South is closing the gaps that divided it from the rest of the country. It is unmistakably joining the mainland of American development." And it calls this "the great break-through."

Convincing Statistics

The statistics of your industrial revolution certainly bear that out. Now I realize that you can prove anything with a few statistics. Perhaps you remember the story of the statistician who was drowned while crossing a river that had an average depth of only four feet, six and a half inches. But the statistics I have seen are completely convincing.

The rest of the nation has done pretty well since 1940, but your gain in per capita income has been running about 50% ahead of the national average. New industry is going up here at a rate about 45% above that of the U. S. as a whole.

It is estimated that of every four dollars being invested in new chemical plants, three are spent in the South. In the past ten years, consumption of steel here has doubled. Since 1940, your annual farm income has risen from two to six billion dollars. About 10% of your farm help has left the farm.

but you have off-set that by increasing use of farm machinery about 500%. All this is pretty good for a region that not long ago was regarded by some people solely as a source of raw material and semi-finished products.

That is good for the South, but it is good for the whole nation as well. We are all richer for good wages, a rising standard of living, and new capital invested in the southeastern states. I do not think you can have a truly strong and healthy nation if one-fifth of it is depressed economically.

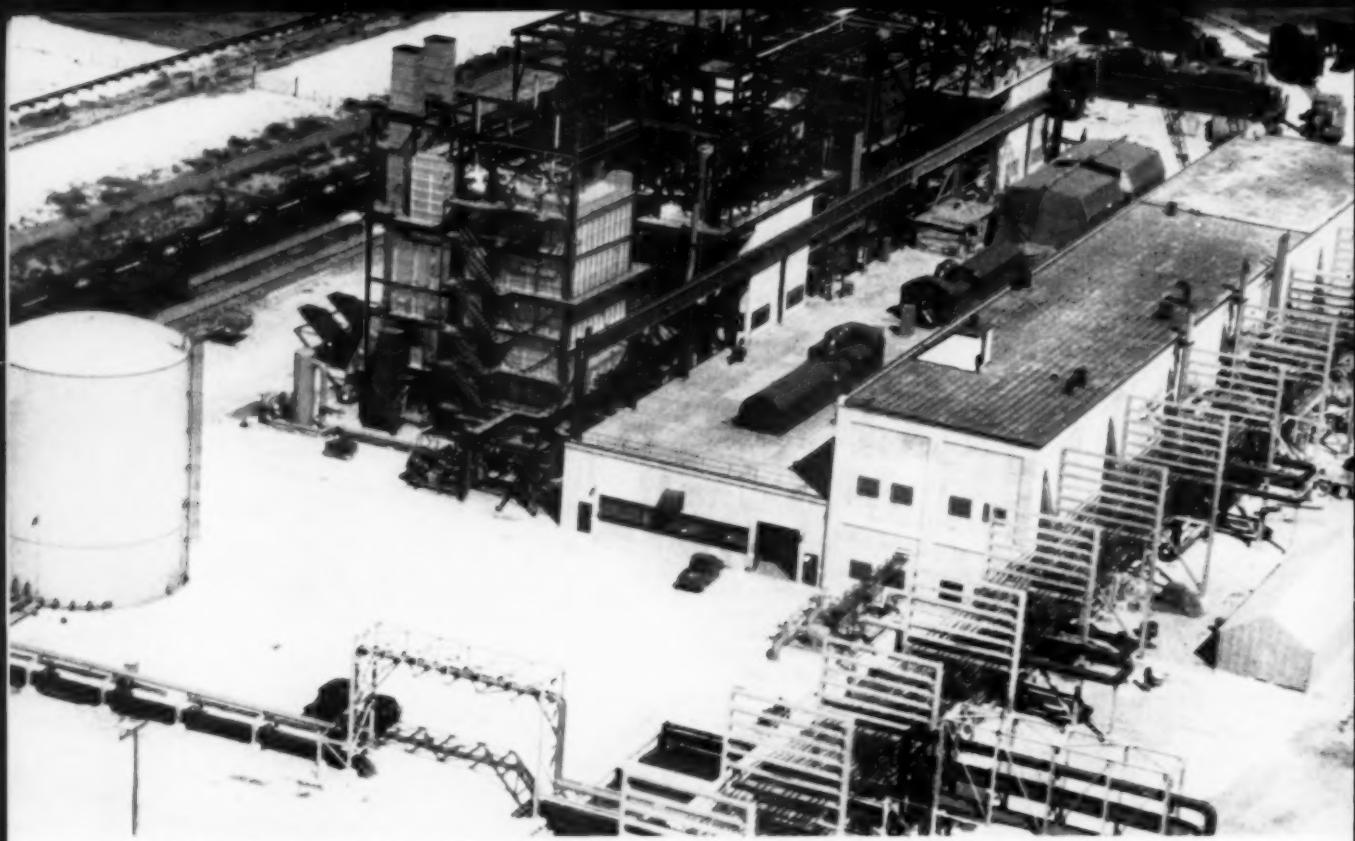
The Formula

America and now the New South have achieved health and strength through an economic formula that no one else in the world follows and hardly anyone else seems to understand. That formula is built on several special propositions within the framework of our capitalist system. The base of the American economic pyramid must rest on the expanding consumption of goods. These goods, mass-produced cheaply for a mass market, are the same for all customers. There must be an ever-widening distribution of income among the great majority of all the people, in order that they may buy these goods. And the best way to achieve this income distribution is by investing in better equipment and new processes, so that prices can be reduced as the hourly output per worker rises.

You have fine natural resources here—water power, some forty of the minerals most useful to mankind, a labor pool of seven million industrial and service workers. But your most valuable asset, it seems to me, is one that some of us may be inclined to overlook. That is your consuming public—the growing consumer market of your own people. As they work and earn, save and spend, produce and consume, they are the backbone of the whole economy of the South.

The Problems Ahead

Despite its great and rapid advances, the South still has only 17% of the nation's industry. It should and will have more than that. You have made tremendous strides in industrial research—but you still do only 4% of the total industrial research being done in the United States. It should be more than that. Your per capita income is still almost 40% below the national average. There is every reason for it to go higher, and I predict that it will continue its present rise.



View showing No. 3 Power Plant and surrounding area. Condensate tank, 500,000 gallons, on left. Four boilers, two in course of construction. Three turbine units, one under erection shelter. On the right, steel structure for supporting 13.8 kv cables and pipe lines to process.

Dow Power in Texas—500,000 KW

THE THREE interconnected power plants that serve Dow Chemical Company, Freeport, Texas, are so interrelated with the chemical operations they serve that a general description of the system as a whole is essential in order to give a clear understanding of the latest power additions. Therefore, this article is divided into three sections: 1—Brief History of Dow in Texas, 2—Brief History of the Power System, 3—Description of the Newest Power Plant.

Dow has two large chemical plants, A and B, which are about 5 miles apart, served by three power plants. These designations "chemical plants A and B," and "power plants 1, 2 and 3," are employed throughout the following description.

The latest unit, 60,000 kw, at Plant No. 2 went on the line on April 7, 1953, and the third 40,000 kw unit at Plant No. 3 will start operations in September. The total capability in the three power plants is now 512,000 kw.

By A. D. RUST
Engineering Consultant
The Dow Chemical Company
Freeport, Texas

BRIEF HISTORY OF DOW IN TEXAS

In 1939 a rather extensive survey was made to determine the best site on the Gulf Coast for a Dow plant. After Freeport was selected a relatively small plant was built and by expansion of the original operations and the introduction of new products and operations it has developed into the present very extensive group of plants representing investments totaling approxi-

mately 200 million dollars and now producing about 65 chemicals in large quantities. During the intervening period World War II caused extensive expansions which were later converted to peace-time uses.

Reasons for Location

The plant was located at Freeport principally on the basis of raw materials supply and a site with

-PERSONNEL

The Power Department at Freeport is directed by MR. J. H. McCULLOUGH, Power Production Manager. MR. J. S. RUSH is General Superintendent of Power and directs the operation of the three power plants as well as sea water intake pumping stations and some phases of the utility distribution systems, including steam and condensate lines. MR. J. P. WARREN, formerly superintendent of power at Plant B, is now Power Consultant, assisting Mr. McCullough in staff functions.

Mr. E. W. JOHNSON is Superintendent of Power Plant No. 1 at Plant A. Mr. T. E POUNDS is Superintendent of Power Plant No. 2, and Mr. S. W. STOVALL is Superintendent of Power Plant No. 3, the new out-door plant.

new out-door plant.

Mr. A. D. RUST, now Engineering Consultant in the Engineering Department, has been engaged in the engineering, operation and coordination of power work at Freeport since the start of original design for Power Plant No. 1. (See article S. P. & I., February, 1945.) The Austin Company were engineers and contractors for the original plant. Stone and Webster Engineering Corporation engineered the first power plant at Plant B in 1942 and they have done the engineering and contracting for two recent additions to that plant. Stone and Webster were engineers and contractors for the out-door plant recently completed. Mr. Rust has been the Dow liaison engineer with Stone and Webster for both the 1942 job and those done within the past three years.

suitable topography. The basic raw materials were clean high purity sea water, oyster shells, salt, fresh water, sulphur, natural gas and liquid petroleum gas, all of which were available in adequate quantities in the area. Other features of importance in plant location such as railroad and water transportation facilities, tax rates, labor, and weather were considered to be satisfactory or not too difficult to meliorate.

The geography of the location is such that enormous quantities of sea water can be used for the ex-

traction of magnesium and bromine and for cooling in heat exchangers and power plant condensers without danger of recirculation.

The original products were caustic, magnesium, chlorine, ethylene dibromide (Ethyl-Dow Chemical Co.) and chlorinated hydrocarbons. All of these products are made by continuous-flow large-quantity methods and power and steam are important factors in their manufacture. Industrial chemists will note that there are important phases of interdependence among some of the produc-

Cross section of power plant structure.

tion items which are quite significant in the economical operation of such plants.

Power Requirements

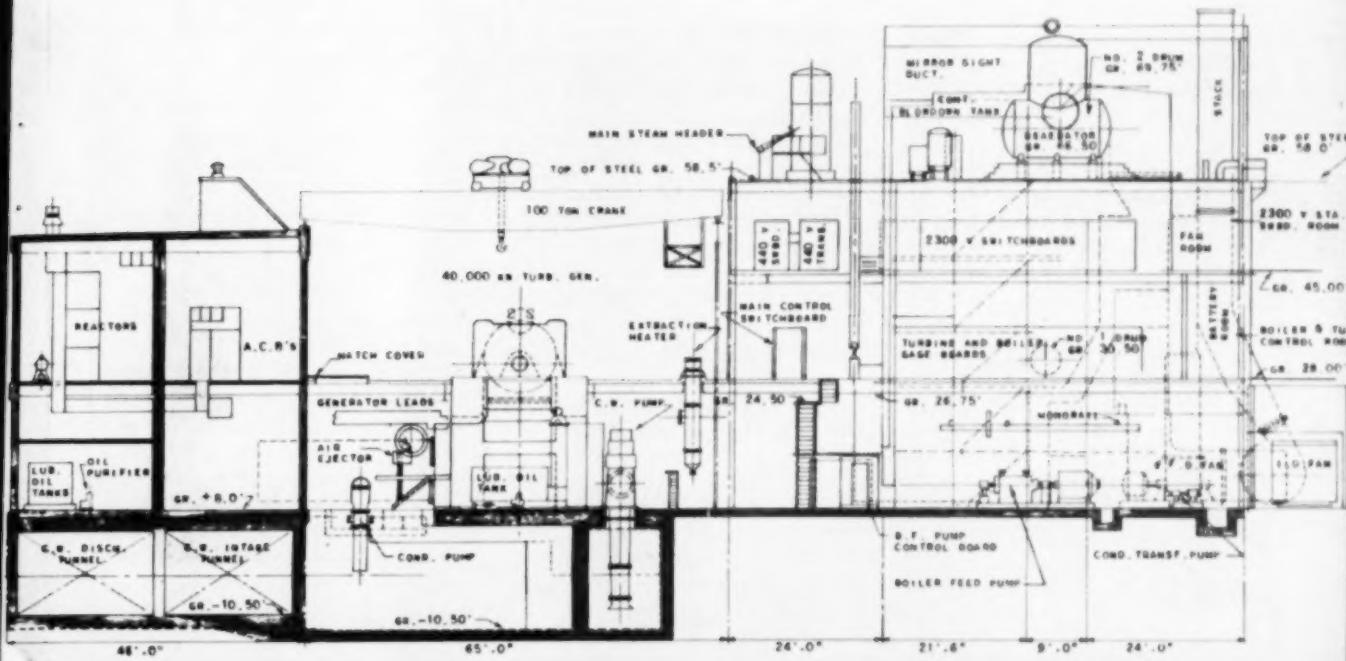
Cheap power is necessary in order to economically manufacture magnesium and chlorine and low cost steam is an important item in the cost of caustic as well as many other products.

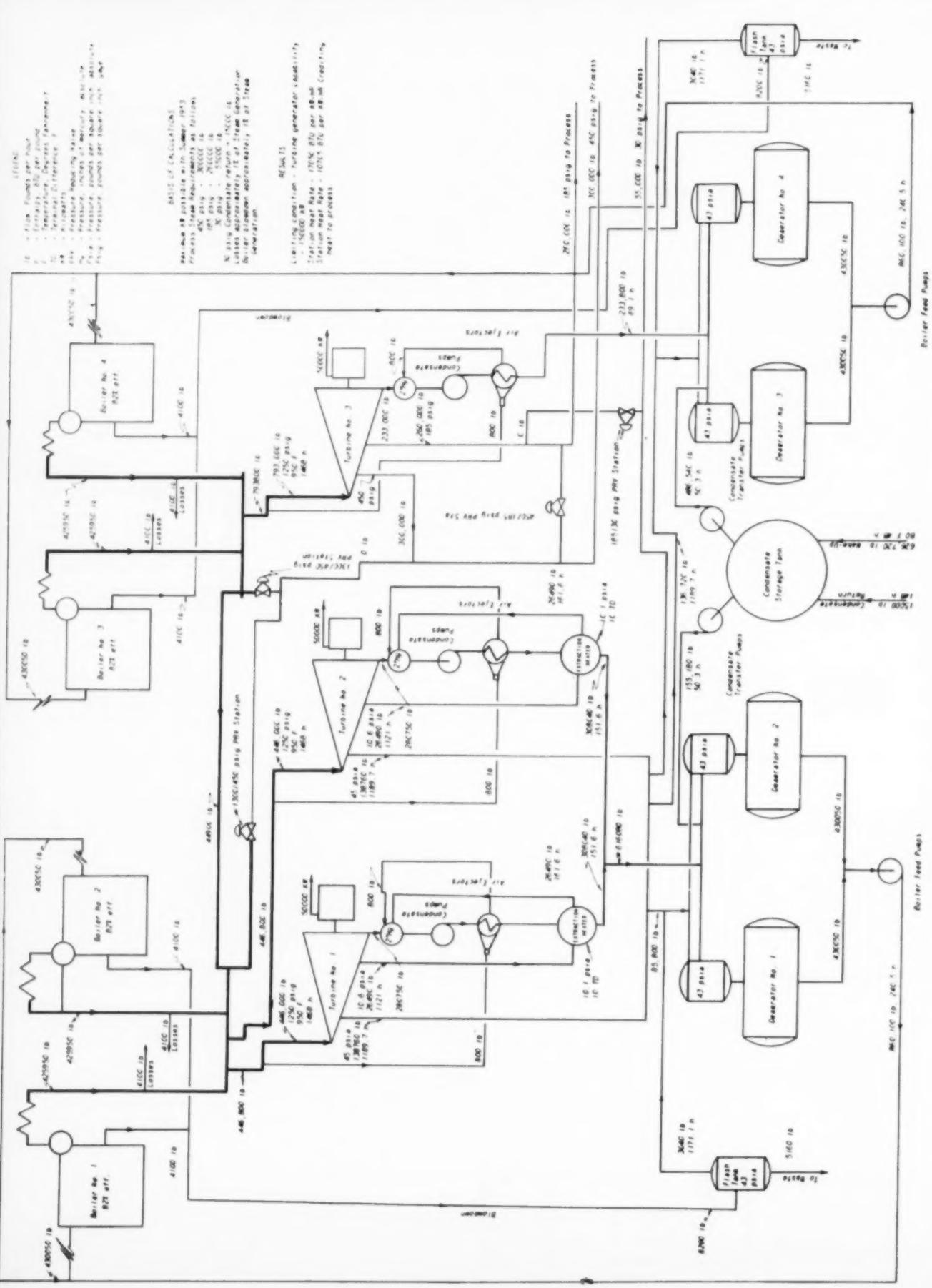
In addition to having power and steam available at a moderate cost, these utilities must be located within the general plant scheme so that power feeders and steam lines are as short as possible. Some of the data given later will demonstrate this point.

The feature of provisions for flexibility has had to be stressed at all times. Demands for process steam of various pressures may increase or decrease and locations of areas of maximum demand may change. The ratios of process steam demand to power demand change over a wide range. The ideal is to design for the results demanded with a minimum of cost but to include provisions for a maximum of flexibility to be adaptable for future demands.

Local Conditions

There are several important local conditions which have a material influence on the design of power plants and utility facilities.





Heat balance diagram
for Power Plant No. 3.



The elevation of the ground area is only 4 to 10 ft above mean low tide, hence, levees must be constructed around many areas, both municipal and industrial. On account of the possibility of hurricanes all structures are designed

for wind loads of 30 lb/sq ft for the first 30 ft of height and 40 lb/sq ft for over 30 ft.

Sub soil conditions and the water table are such that all structures of any weight are built on piles and any structures built below grade may be buoyant unless weighted properly. Atmospheric and rainfall conditions are such that totally enclosed motors must be used to get satisfactory service.

plants other facilities are included as a part of power plants. These include dehydrated compressed air at 100 psi, high pressure sea water at 64 psi for cooling purposes and CO₂ (flue gas). In addition, the Power Department also has charge of the network of steam and condensate distribution lines.

Growth of System

The power system at Freeport has grown from an initial installation of two turbo-generators with a total capacity of 30,000 kw to a system of 16 turbo-generators in three plants having a capacity of 512,000 kw today or approximately 1700% in 13 years.

Unusual Design

Devices to provide for economical operation under variable or low conditions are unnecessary since the loads commonly carried in both steam and power are uniformly high and there are no significant peaks and valleys in the load curves.

The switchgear for outgoing feeders on the 13.8 kv circuits is much more extensive than may be expected in utility plants of like size because of what amounts to individual customer distribution from the power plant. For instance, we have just completed an addition to Plant No. 2 of a 40,000 kw unit and a 60,000 kw unit but 12 13,800-volt circuit breakers were required although only two of them are generator breakers.

Machine shops and labor forces for repair work are provided for adequately by the main plant shops.

Boiler stacks are low since it is only necessary to make them of sufficient height to dispose of clean hot gases. Reasonably clean stack gases are available and are used as a source of CO₂.

Present Power System

There are now three power plants all connected through the 132 kv power system and No. 1 and 3 are connected together through the 13,800 v system at plant "A."

Power Plants 1 and 3 are connected by means of steam lines to deliver process steam at sev-

BRIEF HISTORY OF POWER SYSTEM

The power systems of Plants A and B operate with a primary voltage of 13,800 and all plants are connected with each other and with the Houston Lighting and Power Company so that large blocks of power can be transferred at 132 kv.

Special Requirements

Readers should bear in mind that there is a vast difference between methods of power production in an industrial plant of this kind and a utility plant, and that the most notable difference is load factor. The average load factor for four of the largest of the country's utilities is 0.55, whereas the load factor at Freeport is 0.95.

Another extremely important difference is the use of extraction and back pressure steam for process operations, which permits production of power and steam at very interesting costs. The good utility plant loses 2/3 of the heat value of every pound of steam to the condenser, but in an industrial power plant the loss can be avoided for all extracted and back pressure flow. (See Ref. No. 4 & 5.)

Another factor which is highly important in continuous process plants and associated with the load factor is that the load, either steam power or compressed air, can never be dropped except in case of some emergency or on rare occasions when some process operation is shut down. For this reason we often have an unusual amount of stand-by equipment to insure continuity of operation.

This is a very important feature in design at Freeport.

Steam

Steam conditions at Power Plant No. 1 are 400 psi, 750 F, which were considered economical on the basis of 1940 fuel costs. Process steam is distributed from this plant at 400 psi, 150 psi and 30 psi. One unusual design condition is that the turbo-generators were installed with the steam ends away from the boilers to facilitate the installation and exit from the building of large and bulky 30 psi steam lines.

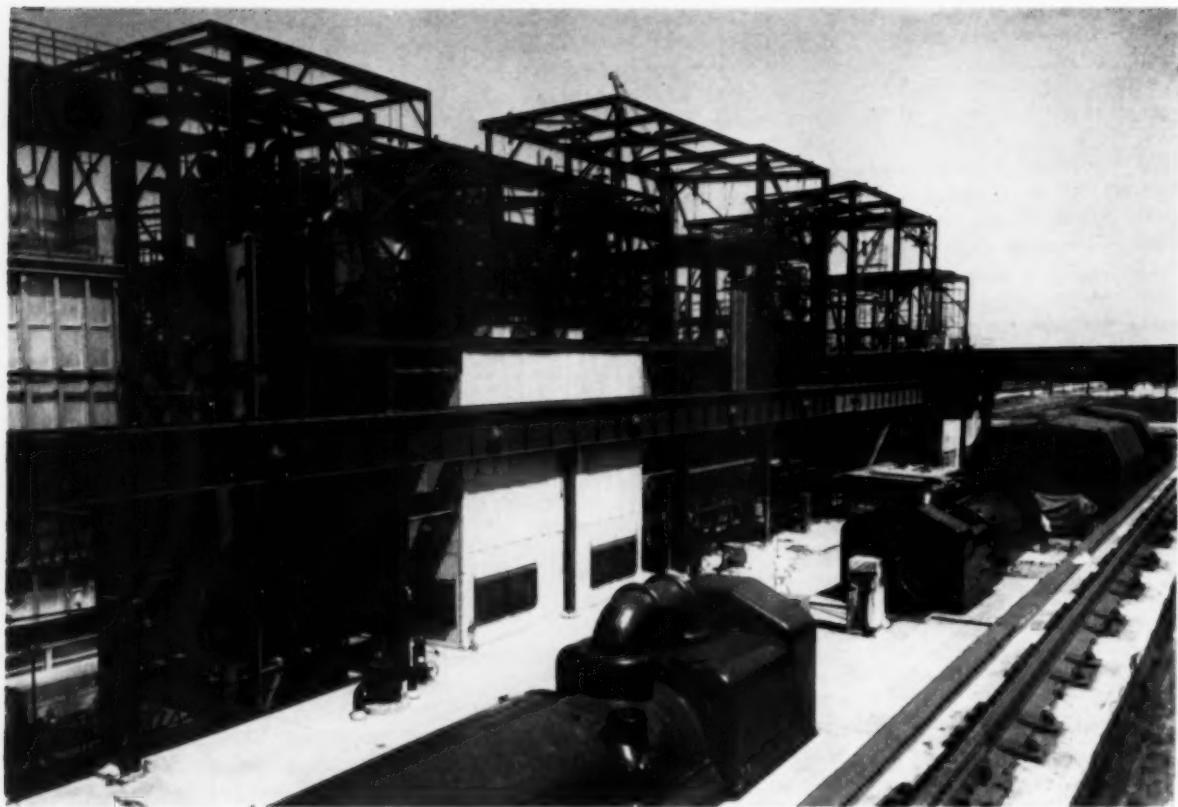
According to a diagram appearing in S. P. & I. in 1945 (See Ref. No. 3), the 30 psi flow in these lines was then approximately 500,000 lb/hr, all back pressure or extraction steam.

Power Plant No. 2 at Plant "B" was designed and built on a wartime basis with some new equipment and some used equipment. It is probably the only large plant ever built which was designed and built as a topping plant from inception.

The initial steam conditions at this plant are 1250 psi, 900 F and 235 psi, 650 F. Originally it had a capacity of 117,500 kw, but has since been increased to 220,000 kw (See Ref. No. 2). Steam is distributed from this plant to process at 450 psi, 235 psi and 30 psi.

Other Facilities

On account of the similarity of operational problems involved and centralized location of power



Showing the turbine end of units 1 and 2, and No. 3 under erection cover. Control room for boilers and turbines is in louvered structure (center) between boilers.

eral pressures to Plant "A" and Plant 2 distributes steam at several pressures over a wide area at Plant "B."

The operation of caustic evaporator plants is a major factor in the boiler feedwater make-up problem. Since these plants operate evaporators at double and triple effect the quantity of return condensate may be more than twice the quantity of steam feed.

Water Purification

Even though we have such advantageous arrangements for make-up it is necessary to be able to treat large quantities of raw fresh water in the preparation of make-up. The economics of this problem has been investigated many times and the final solution has been deion (demineralization) plants. Both of the regeneration materials, hydrochloric acid and sodium hydroxide, are produced on the site and the resins used are Dow products.

We can produce deion plant ef-

fluent which is quite satisfactory for 1250 psi boilers and permits us to carry very low boiler concentrations with low blow-down. We can produce about 1000 gpm of deion water at Plant 1 and 600 gpm at Plant 2. Deion water produced at Plant 1 is pumped to Plant 3 to supply make-up for that plant.

Power Plant No. 3

In the fall of 1950 it became apparent that in addition to those extensions then in progress, new power facilities would be necessary. Due consideration was given

to several sites by weighing the factors of condenser water availability, power and steam distribution, and other miscellaneous items. The plant was finally located in the N. W. portion of the plant "A" property, convenient to a large power load, to the 132 kv substation, and to a steam distribution system capable of absorbing large quantities of extraction steam. An unusual factor which we have taken advantage of is that heat liberated to the sea water used in condensers is quite beneficial to the bromine process (Ref. No. 1).

DESCRIPTION OF NEWEST POWER PLANT

(All photographs and diagrams in this article apply to Plant No. 3)

Plant No. 3, like No. 2 and No. 1, generates and distributes power at 13,800 volts and substations located at convenient points distribute at 2300, although the major users such as rectifier stations for chlorine and magnesium plants use 13,800 volts. All

transmission is by means of bronze armored overhead cables which are expensive in first cost but reliable and convenient for maintenance.

No. 3 plant is interconnected steam-wise with No. 1 plant through 400 psi, 150 psi and 30 psi

steam lines and the plant is capable of supplying large quantities of extraction steam at these conditions.

The steam conditions selected for this plant, 1250 psi, 950 F, were based on the predicted costs of natural gas and the advantages of selecting an AIEE-ASME Preferred Standard set of conditions. It is very apparent now (1953) that our estimates on costs of natural gas were not too high.

On the basis of our observations it was decided to use outdoor methods, so the boilers are 100% out-door and the turbine installations are closed-in only from the turbine floor down. For those interested in making comparisons on a climatic basis, we have a normal rainfall of 45 inches, the temperature will go down to 32 F every winter, and down to 20 F or less every ten years. The atmosphere is influenced by winds from the Gulf. (See Ref. No. 6.)

We have not used regenerative cycles extensively because they do not prove to be economical but in Plants 2 and 3 we have in several cases installed one low pressure, closed heater in between the condenser and the deaerating heater.

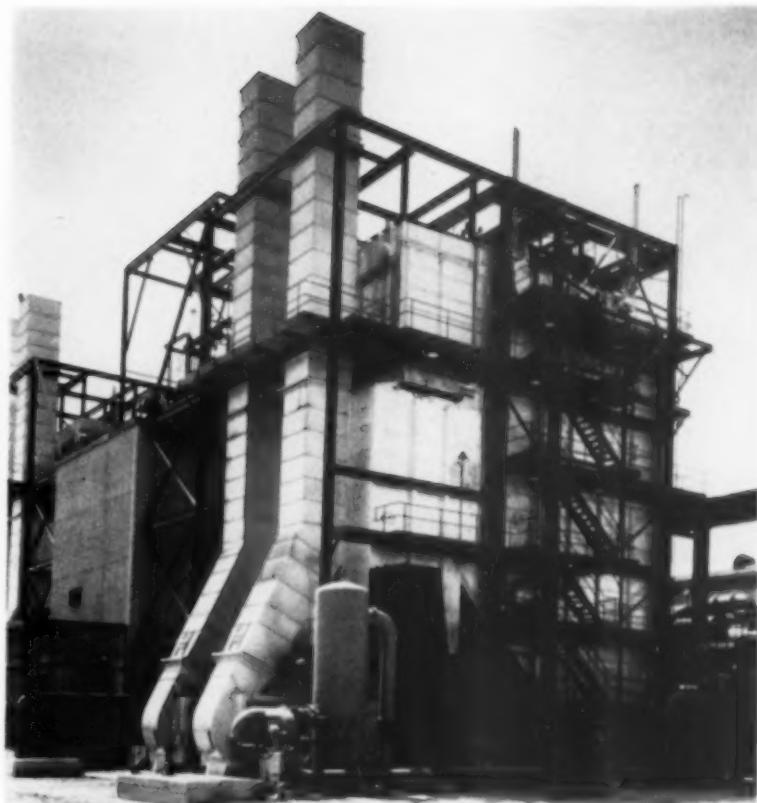
External Facilities

The site selected for this plant is convenient to Plant A railroad tracks and one track has been extended to run parallel to the structure and cars can be spotted under the plant crane. Condenser cooling water facilities (sea water) must be designed for the ultimate plant, so the provisions for sea water are flumes under the electrical bay large enough for 400,000 gpm. Screen intake structure is designed to be extended as needed. Fire hydrants are distributed about the area with a source of water being the Plant A system.

Building

The steel structure to support the many power cables and process plant pipe lines for steam, etc., have been constructed to conform to the existing systems and to provide for a reasonable quantity of future cables and pipes.

The structure is practically all



Side and rear of boiler No. 1; fuel gas lines and scrubber in lower center; rear of control room and one station service transformer on left.

reinforced concrete, built on reinforced concrete piles, and arranged so that turbine units are located with the long dimension parallel to the length of the building. The railroad track is to be shortened as the building is extended.

The control room for each group of units is located between pairs of boilers so that the control room operator has a fair view of the fronts of two boilers and of two turbines.

The area between boilers is designed with boiler feed equipment on the ground floor, main control room on the second floor, auxiliary switchgear on the third floor and deaerators on the roof, which makes a neat and compact arrangement.

The office, the control room, the auxiliary switchgear room and the bay housing 13.8 kv switchgear are air conditioned, for comfort and to guard against dampness and corrosive atmosphere. We have found that sensitive relays do not operate in a satisfactory manner unless protected in this manner. The area

under the turbine floor is completely housed, weather-proofed and mechanically ventilated.

Boilers

There are four 450,000 lb/hr boilers arranged in groups of two and additions can be made of equal size or larger boilers without disturbing the arrangement. The fuel is natural gas exclusively and since there are many sources, including a Dow subsidiary, the fuel supply is considered to be reliable. The gas enters the Plant A area at high pressure, is reduced to approximately 45 psi and then scrubbed, metered and reduced to 20 psi near the boilers.

The boilers are Riley gas fired design, which means a low overall height. High structures are expensive where 40 lb sq ft wind loads are used. The steam drum is only 61'-9" above the ground floor. Each boiler is equipped with 2 induced and 2 forced draft fans, tubular air heater, economizer and primary and secondary pendant type super-

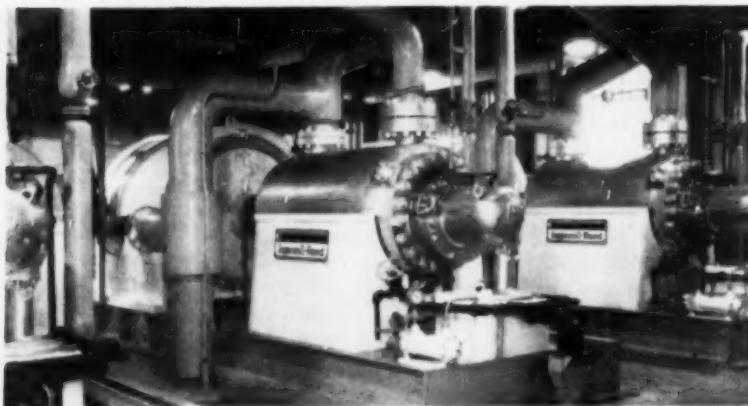


Interior of No. 1 control room, with No. 1 boiler and turbine control board on right, No. 2 on left. The switchgear and generator control board is in rear. The all-over louvered ceiling is provided with 50 cp lighting.

heater. Steam temperature is maintained by means of gear operated dampers in the primary section. High silicone aluminum paint is used for all hot outside surfaces and gives exceptionally good service. All boilers are equipped for the Dowell process of internal cleaning.

There are ten Peabody center fire burners on each boiler and the arrangement is such that the variation in superheat temperatures across the boiler does not exceed 30 F. Safety devices are provided which will trip gas on induced draft fan failure, give alarm on low gas pressure or prevent opening main gas valve until furnace has been purged with air.

View of one set of three boiler feed pumps, located in space below the control room.



Turbo-generators 1 & 2

These two Westinghouse units have a nominal rating of 40,000 kw but can be operated at 50,000 kw continuously. The generators have a maximum rating of 57,500 kva with 15 psi hydrogen. The condensers for these two units are sized so that the turbines may be operated at more than 40,000 kw without extraction.

Provisions have been made for using either fresh water or sea water in both the hydrogen coolers and the lube oil coolers but the normal source is sea water which has been screened and chlorinated. With the proper metals, this method has been successful and the hy-

drogen coolers are mounted in the generator case.

Lube oil is treated continuously with a DeLaval separator on each unit and plant storage tanks are provided for time treatment and a complete change if necessary.

Units No. 1 and 2 are each equipped for automatic extraction of 300,000 lb/hr of 30 psi steam. The steam extracted goes to de-aerators for boiler feed heating and to process plants.

Turbo-generator No. 3

This General Electric unit has approximately the same generator characteristics as Units No. 1 and 2 except that the maximum conditions are 30 psi hydrogen and 61,250 kva. The cooling and lube oil systems are similar. Unit No. 3 is designed for automatic extraction of 400,000 lb/hr of 450 psi and 400,000 lb/hr of 185 psi steam but it has a condenser large enough so that it can be operated at over 40,000 kw without extraction.

Condenser System

There are three Westinghouse 37,500 sq ft surface condensers all substantially the same and all tubed with aluminum brass tubes. Condensers are designed for a sea water velocity of 6.75 ft per second and such tubes have a normal life here of 10 years. The steel water boxes are lined with bitumastic or

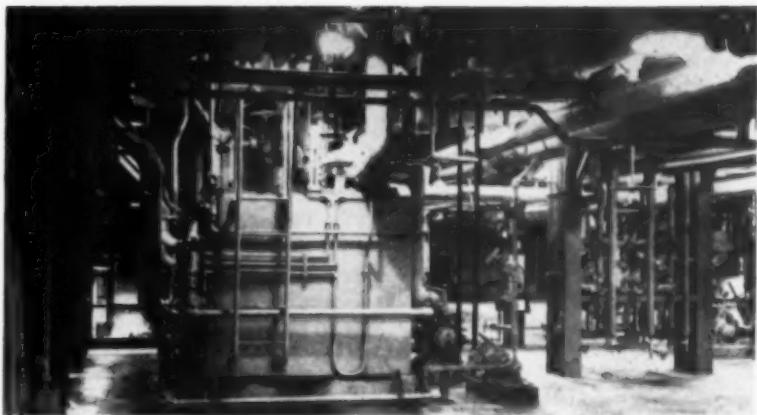
plastic coatings and magnesium anode cathodic protection is installed which will protect the tube sheets, tube ends and any possible exposed areas in the water boxes. These condensers are all vertically split single pass type, and under reduced loads one side can be acidized while the unit is operating.

There are two 30,500 gpm circulating water pumps for each unit. These pumps are vertical with propeller type impellers and driven by 200 hp motors. All circulating water system piping is lined with bitumastic enamel for protection against sea water corrosion. There are two (one stand-by) 6 stage vertical pit type condensate pumps driven by 100 hp motors.

Feedwater Cycle

Condensate for make-up, which may be as much as 50%, is conveyed by pipe line from a deion plant at Plant No. 1 to a 500,000 gallon storage tank at Plant No. 3. Some condensate is returned direct to Plant No. 3 from process. Condensate from Units No. 1 and 2 passes through single stage heaters and deaerators and condensate from Unit No. 3 passes direct to deaerators.

There are six Ingersoll-Rand barrel type 8 stage boiler feed pumps arranged in groups of three, one of each three being a stand-by.



View on ground or condenser room floor. The principal object shown is the lubricating oil reservoir for No. 2 turbine.

The pumps take suction from 4 Cochrane deaerators and deliver to the feedwater system which is cross connected so that water from any pump may go to any boiler.

The 3-element Republic regulators in this system are installed with electrically operated positioning valves in the by-passes to insure continuity of operation.

Auxiliary Equipment

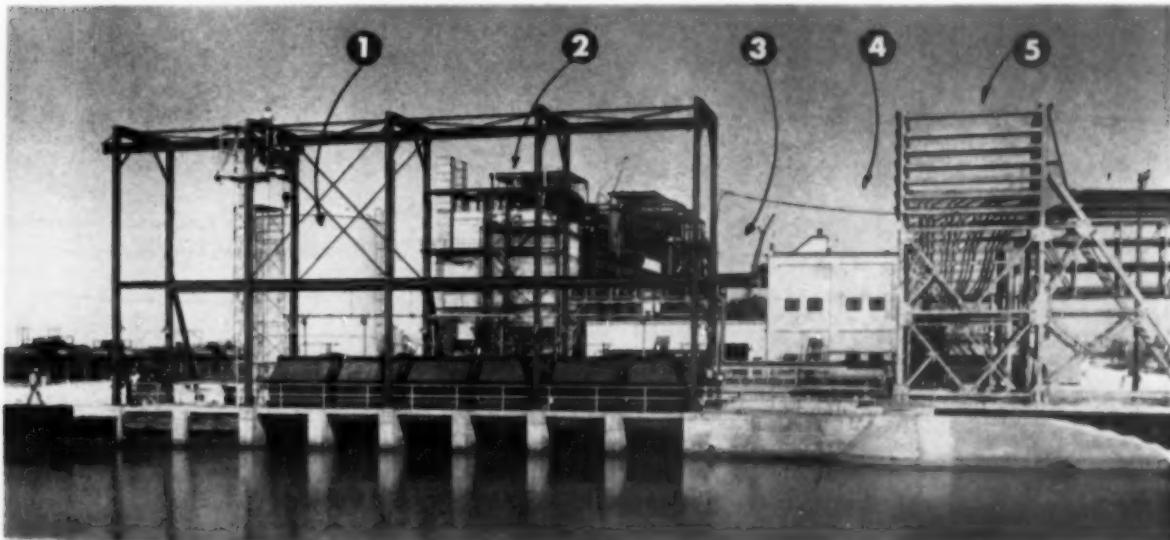
All of the large Chapman steam valves are of the pressure seal bonnet type and the chrome-moly steam piping is a completely welded system which helps to avoid shut-downs for leaks. We use Ashcroft power control valves on the

main steam headers for relief to avoid blowing of boiler and superheater relief valves.

There are 4 pressure reducing and 6 desuperheating stations in this plant. Provisions are made for automatically picking up extraction steam loads if turbines trip. The furnishing of desuperheating water in quantities over a range of zero to 200 gpm has involved serious problems in types of regulating valves, metals and control methods.

In this case we have installed a system so that boiler feedwater at approximately 1800 psi is cut to 700 psi at a central point and delivered to all desuperheating stations. The 1800-700 psi station is

View looking east from west bank of sea water canal showing six traveling screens in foreground. (1) The 500,000 gallon condensate tank. (2) Boilers. (3) Turbines. (4) The office end of the electrical bay. (5) Steel supports for piping and cables. Construction work is still being done.



designed so that there is a minimum flow of 20 gpm to avoid "wire drawing" of valves. There are electric tracer systems (anti-freeze systems) installed on all lines which might be expected to freeze in winter. In some cases instrument lines are traced in groups.

There are three Ingersoll-Rand air compressors, one 2000 cfm, one 250 cfm and one garage type. Kemp dehydration is installed for 2000 cfm. There are provisions for two more 2000 cfm compressors and dehydrators. Most of this air is used in process operations.

There are two 10,000 gpm Ingersoll-Rand sea water pumps which provide sea water at 65 psi for oil coolers, hydrogen coolers and other

services as well as cooling water to process operations.

Control Rooms

Centrally located control rooms are designed on the basis of one control room operator attending two boilers and two turbines, and all control equipment, including a very extensive alarm and annunciation system, is located for maximum convenience to the operator. The same operator will control all 13.8 kv switchgear and out-going feeders.

Electrical Equipment

Power is generated at 13.8 kv and carried through generator breakers to three busses which are

connected through reactors with a synchronizing bus. There are six out-going feeders and four feeders to four auxiliary station service transformers 13.8/2.4 kv. All 13.8 kv breakers are Westinghouse air blast type and either 2000 or 3000 amp.

Motors of 100 hp and over are carried on the 2300 volt system and smaller motors are 440 volt. There is a 200 kw emergency exciter available for use on any generator. Station lighting is 110 volt and there is a 60 cell battery installation to provide for emergency lighting and the operation of motor operated valves. Adequate tele-

(Continued on page 133)

PRINCIPAL EQUIPMENT—Power Plant No. 3, Dow Chemical Company, Freeport, Texas

GENERAL DATA

Name of Station	Power Plant No. 3 (A-1501).
Station Site	Plant A, Freeport, Texas.
Total Generating Capacity	150,000 kw (capability).
Total Boiler Capacity	1,800,000 lb per hr
Steam Pressure	1250 psi.
Steam Temperature	950 F.
Cooling Water Source	Gulf of Mexico.
Design and Construction	Stone & Webster Engineering Corp.

GENERATING UNIT

Turbine Generators	Two—Westinghouse; One—General Electric 3600 rpm, 40,000 kw, 57,500 kva, 13 psi H ₂ 13,800 v, 3 phase, direct connected. Steam pressure 1250 psi, 950 F. Extracting and Condensing.
Exciters	Two—Westinghouse; One—General Electric, 250 v, direct connected.
Hydrogen Coolers	Integral with generators, Westinghouse and General Electric, surface type.
Turbine Oil Coolers	Integral with turbine oil reservoir, Westinghouse and Andale.
Turbine Oil Filters	Three—DeLaval.
Lubricating Oil Tank	One—Missouri Boiler Works.
Lubricating Oil Pump	Viking Pump Company.

CONDENSING EQUIPMENT

Condensers	Three—Westinghouse, single pass divided water box, 37,500 sq ft.
Circulating Pumps	Two per Condenser—Westinghouse, vertical, 36,500 gpm, TEFC Motors, 200 hp.
Condensate Pumps	Two per Condenser—Westinghouse, vertical, 869 gpm, TEFC Motors, 100 hp.
Air Removal Equipment	Westinghouse, steam jet.
Priming Ejectors	One per Condenser, Westinghouse, steam jet.
Expansion Joints for Condenser Piping	U. S. Rubber Company, four 42 in. per condenser; no expansion joint between turbine and condenser.
Traveling Water Screens	Link Belt Company.

BOILERS AND EQUIPMENT

Boilers	Four—Riley Stoker Corp., two-drum, gas fuel only, 12,870 sq ft boiler heating surface, 450,000 lb per hr each, 1300 psi, 60 in. steam drum, 42 in. mud drum.
Superheater	Riley Stoker Corp., with damper control, pendant, 16,200 sq ft surface, 950 F total steam temperature.
Furnaces	One per Boiler, 22,600 cu ft volume water cooled 100 per cent, 6400 sq ft heating surface in water walls.
Air Heaters	One per Boiler, Riley Stoker Corp., straight tubular, 51,500 sq ft heating surface, 510,000 lb/hr, 640 F inlet temperature, 360 F outlet.
Soot Blowers and Ejectors	None.
Blow-Off Valves	Seven per boiler—Edwards, 1½ in.
Water Columns	Diamond, Bi-color.
Safety Valves	Three per Boiler—Consolidated.
Burners	Ten per Boiler—Peabody, center fired, 66,000 cu ft/hr.
Gas Safety Trip and Shut-Off Valves	Mason-Nellan Regulator Co.
Combustion Control	Leeds & Northrup.

DRAFT EQUIPMENT

Stacks	Two per boiler—Riley Stoker Corp. integral with boiler; rectangular, 88 ft high.
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SMOKE BREECHING

Forced Draft Fans	Riley Stoker Corp. Two per boiler—Sturtevant, 320,000 lb/hr, TEFC constant speed motor.
Induced Draft Fans	Two per boiler—Sturtevant, 320,000 lb/hr, TEFC constant speed motor.
Draft Gages	One per Boiler—Hays, 8 point.
Draft Controls	Four per Boiler—Leeds & Northrup electric motor positioning.

BOILER FEEDWATER EQUIPMENT

Boiler Feed Pumps	Six—Ingersoll-Rand, Barrel type, 535,000 lb/hr, 3,743 ft TDH, 3,600 rpm, TEFC 1500 hp Westinghouse motor drives.
Bleeder Heaters	Two—Griscom-Russell, 12.7 psi absolute steam supply, vertical straight tube.
Generating Heaters	Four—Cochrane, steam jet and receiver, 500,000 lb/hr.
Feedwater Regulators	Four—Republic Flow Meters, one for each boiler, 3 element.
Evaporator	None—Use Deion Water.
Make-up Pumps	Four—Ingersoll-Rand, centrifugal; two are 227 gpm capacity and two are 1000 gpm; TEFC motor drives.

PIPE AND VALVES

Piping Contractor	Alloy Steam and Boiler Feed—Grinnell Co.
Steam Header	12 in. Sch. 160, chrome-moly.
Check Valves	Chapman.
Gate Valves	Chapman.
Non-Return Valves	Edwards.
Pressure-Reducing Valves	Republic.
Desuperheater	Republic.
Small Valves	Edwards & Hancock.
Reverse Flow Valves	Turbo Mfrs.
Automatic Relief Valves	Atwood & Morrill.

INSTRUMENTS

Steam Flow Meters	Three—Bailey Meter Co. on turbine and four Bailey Meter on boiler.
Boiler Meters	Four—Bailey Meter Co.
Feedwater Flow Meters	Four—Bailey Meter Co.
Draft Gages	Four—Hays, 8 point.
Pressure Gages	Ashcroft indicating and Bailey recording.
Vacuum Gages	Ashcroft indicating and Bristol recording.
Thermometers	Palmer and Manning, Maxwell & Moore indicating; and Leeds & Northrup recording.
Condensate Conductivity Recorder	Leeds & Northrup, Multipoint.
Master Pilot Steam Gage	Crosby S.G. & V.
Motor Generator Sets	Two—Westinghouse, 1½ kw.

MISCELLANEOUS

Emergency Sea Water Pump	One—Morris Machine Works, vertical, 120,000 gpm.
House and Process Sea Water Service	Two—Ingersoll-Rand, 10,000 gpm.
Air Compressor	One—Ingersoll-Rand, reciprocating horizontal, 2000 cfm, 100 psi; Westinghouse synchronous motor drive.
Air Dehydrator	C. M. Kemp Mfg. Co., 2000 cfm.
Turbine Room Crane	Whiting, 100 tons.
Water Tanks	One—Chicago Bridge & Iron, 500,000 gal, condensate storage.
Motor Drive Couplings	Most couplings are Falk.
Air Conditioning Equipment	Natkin & Company.
Louvered Ceiling, Office & Control Rooms	Fullerton Mfg. Co., all-over type.

Opposed-Piston, Dual-Fuel Engine

Operating Report—Rayville, Louisiana.

THE FIRST Fairbanks-Morse opposed-piston engine ever installed for dual-fuel operation completed 8,875 hours of service by the end of 1952 in the Rayville, La., municipal power plant. In that period, the engine produced 7,688,000 kwh at an average fuel cost of 3.19 mills per kwh.

The 10-cylinder opposed-piston engine, rated at 1600 hp at 720 rpm, was installed in mid-1950 in the space formerly occupied by a 360 hp diesel. It drives a 1136 kw, 2400 volt generator with direct-connected exciter.

In more than two years of service, the engine produced 7,688,000 kwh while consuming 84,500,000 cu ft of natural gas and 58,428 gallons of pilot oil. This is an average of 10.9 cu ft of gas and 0.0076 gallons

of oil per kwh. The gas has a heating value of about 800 Btu per cu ft. At full load, it produces a kwh on 10.7 cu ft of gas and 0.006 gallons of oil, a total heat input of 9,412 Btu.

Naturally, the engine builder has had special interest in the performance of this unit and prevailed upon Rayville officials to pull pistons after 4,800 hours for a check of wear on rings, liners, bearings, timing chain and sprockets. The superintendent, Henry Blakeman, reports that nowhere could he find measurable wear. In two and a half years, the only repair has been replacement of two injection nozzle tips.

This 1600 hp engine is the first F-M opposed-piston diesel ever installed for dual-fuel operation. By the end of 1952, the unit had completed 8875 hr of trouble-free service.

PRINCIPAL EQUIPMENT

Engine—1600 hp, 10-cylinder, 720 rpm, opposed-piston dual-fuel, Model 38DS-1/8, Fairbanks-Morse & Co.

Generator—1136 kw, 1420 kva, 3 phase, 60 cycle, 2400 volt, Type TGZO alternator, Fairbanks-Morse & Co.

Governor—Woodward Governor Co.

Fuel Oil—Simmons Oil & Refining Co.

Fuel purifier—Honan-Crane.

Fuel filters—Wm. W. Nugent Co.

Natural gas—Louisiana Power Co.

Gas meter—American Meter Co.

Lubricating oil—Esslube MD, Esso Standard Oil Co.

Lube filters—Honan-Crane and Fairbanks-Morse & Co.

Auxiliary lube pump—George D. Roper Co.

Water pumps—Fairbanks-Morse & Co.

Evaporative coolers—Fairbanks-Morse & Co.

Water softener—Permutit Co.

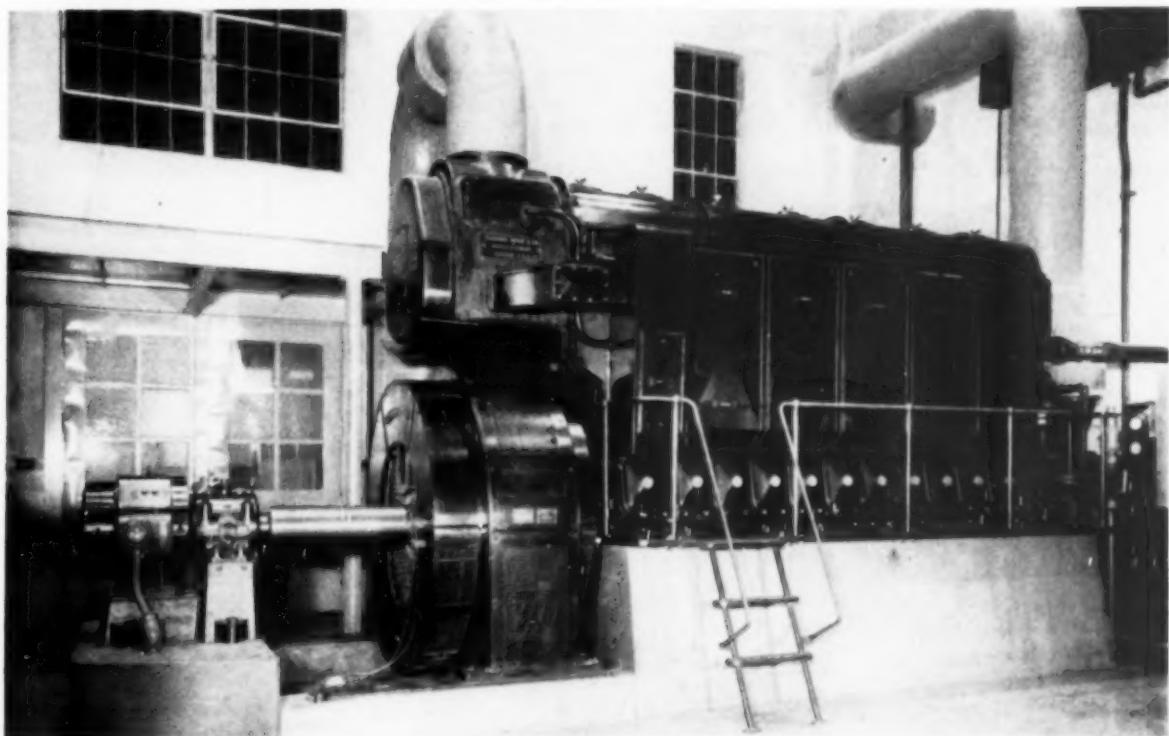
Air filters—American Air Filter Co.

Exhaust snubbers—Burgess-Manning.

Switchboard—General Electric Co.

Alarm panel—Fairbanks-Morse & Co.

Exhaust pyrometers—Alnor, Illinois Testing Laboratories, Inc.



Big dividends in maintenance work

THE ACETYLENE PROCESSES

at Republic Steel's Alabama Plant



Walter S. Schaefer

Mr. Schaefer, mechanical engineering graduate of Fenn College, has had over 15 years' experience in the welding and general industrial field with the Republic Steel Corporation. As welding engineer from 1942-45 he worked on production methods for welding alloy aircraft, bazooka, firebomb and other types of

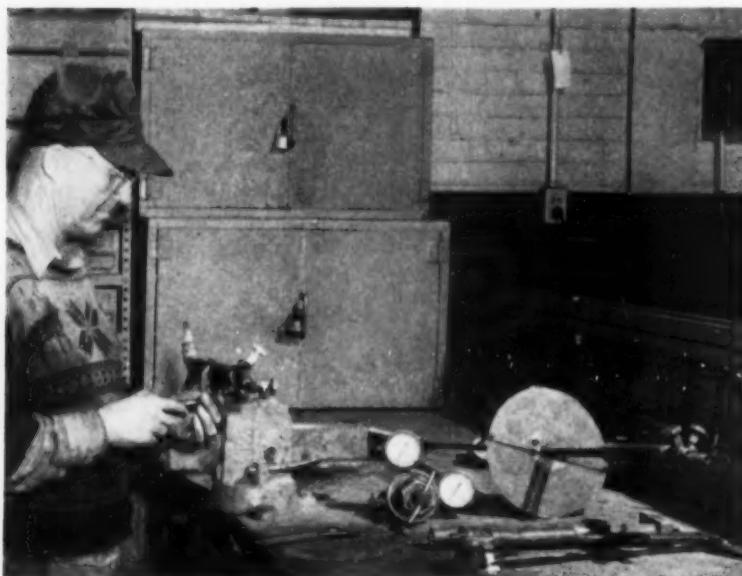
Nearly 300 men handle oxy-acetylene equipment in Republic's Alabama mill. Here are a few of the jobs performed daily by the maintenance crews.

**By WALTER S. SCHAEFER, Development and Welding Engineer
Republic Steel Corporation Gulfsteel Works, Gadsden, Alabama**

tubing. He was division mechanical engineer from 1945-48 for Detroit, Elyria, Cleveland and Brooklyn plants of Republic's Steel & Tubes Div., investigating special problems involving mechanical design of automatic welding equipment. Since 1948, Mr. Schaefer has been development and welding engineer at the Southern District Gadsden, Alabama, plant of Republic, assigned to problems

connected with large diameter expanded pipe production. He has assigned a number of patents on welding processes and equipment and related machinery to Republic Steel Corporation.

This discussion has been adapted from comments by Mr. Schaefer at the 1953 Annual Meeting, International Acetylene Association in Atlanta, Georgia.



Partial view of the repair station at Republic Steel's Gadsden, Alabama, plant, used to maintain the great number of torches, regulators, and allied equipment. All equipment is repaired completely in accordance with manufacturer's recommendations. Proper replacement parts and tools are used. When the equipment leaves the repair station, it is equivalent to a new piece.

Oxy-acetylene equipment is a versatile maintenance tool in nearly every Southern and Southwestern industrial plant. Reclaiming material, hard surfacing, and rebuilding production equipment are time and money saving uses reported by Union Bag and Paper Corporation maintenance personnel in SP&I for August, 1953. Check pages 55-57.

At Republic Steel's Gadsden, Alabama, plant a central source of supply for acetylene and oxygen is utilized as much as possible. This is the bulk oxygen system. Liquid oxygen is delivered to a storage tank having a one and one-half million cubic foot storage capacity. System can deliver up to 100,000 cu ft/hr. There are also three 300 lb and one 500 lb capacity medium-pressure acetylene generators. Acetylene and oxygen are distributed through pipe lines to all major points.



ALTHOUGH spectacular, unusual and difficult welding and cutting jobs are probably the most interesting and challenging, it is the day to day routine work which the acetylene processes perform that pay the biggest dividends in our maintenance work. Some of the work, though simple, is highly repetitive and is performed economically by these means.

The Gulfsteel Works of Republic Steel Corporation at Gadsden, Alabama, is a fully integrated steel plant producing finished plates, pipe, bars, sheets, nails, fencing, and wire; concrete reinforcing matt, bar joists, and bolts and nuts. A battery of coke ovens, two blast furnaces and eight openhearts operate at full capacity to provide sufficient carbon steels to supply these finishing mills. A blooming mill and rod mill roll the semi-finished steel.

This plant contains complete shop and service facilities which handle the largest and smallest maintenance jobs, from delicate instrument maintenance to rebuilding blast and open hearth furnaces.

Maintenance Personnel

Nearly 300 men of those employed here handle oxy-acetylene equipment for maintenance purposes alone. The welding department has 48 employees while the rigger, machine, electrical, locomotive and car, pipe and boiler shops and the foundry each have a number of men who burn, heat treat, gouge, weld, heat, or melt with the oxy-acetylene flame. The millwrights and motor inspectors who are under the joint supervision of the maintenance superintendents

and their production superintendents, make up the balance of the 300 men who daily work with an acetylene flame.

Equipment

For this crew of maintenance welders, a central source of supply for acetylene and oxygen is utilized as much as possible, including a bulk oxygen system. Liquid oxygen is delivered to a storage tank having a one and one-half million cubic foot storage capacity. This system can deliver up to 100,000 cu ft/hr. There are three 300 lb and one 500 lb capacity medium-pressure acetylene generators. The acetylene and oxygen are distributed through pipe lines to all major points. In addition there are many portable oxy-acetylene welding and cutting outfits at locations where piped gases are not available. About one-half of the acetylene is purchased in cylinders. Over 100 welding and cutting outfits are in use and nearly as many other pieces of equipment are used which burn acetylene.

A well equipped repair station is used to maintain these torches, regulators, and allied equipment. All equipment is repaired completely in accordance with manufacturer's recommendations. Proper replacement parts and tools are used. When the equipment leaves the repair station, it is equivalent to a new piece.

There are rare occasions where several hundred pounds of steel, cast iron, or bronze are used on a spectacular job. However, our maintenance work has been so organized that most jobs are handled on a routine basis.

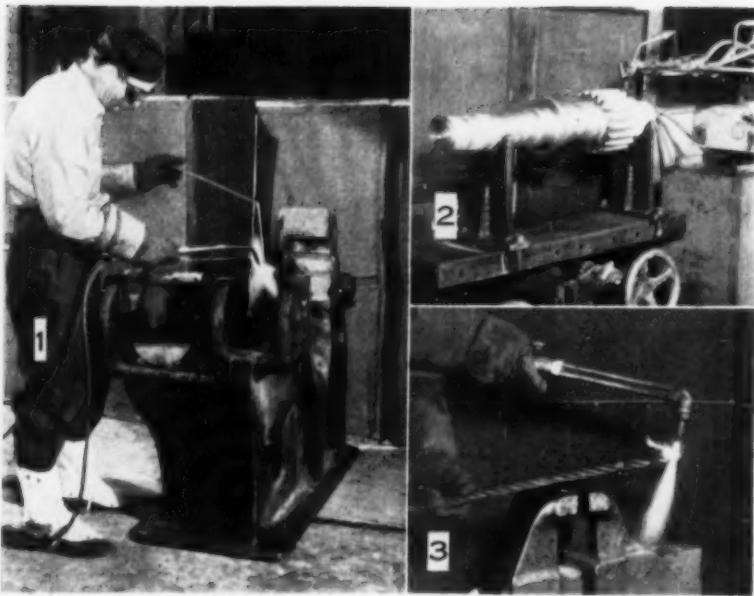
The eighteen applicational views

from our plant's operations illustrate jobs that were performed during a typical day by our maintenance crews. Each utilizes in some way an acetylene flame.

In addition to the illustrated applications machine cutting of large quantities of plate in both production and maintenance operations is standard procedure. The boiler shop has oxy-acetylene cut and fabricated nearly every type of structural component required in the district that can be made from plates and slabs. In conjunction with other departments this shop rebuilds or makes everything from open hearth buckstays to charging machines, from open hearth's doors to scrap cranes, from pan cars to refuse dump cars and from building columns to blast furnace tops.

I believe the illustrations indicate how extremely valuable a tool the acetylene flame is in steel mill maintenance. With it, parts with special alloys can be surfaced to increase their wearability and corrosion resistance. Cast iron parts can be repaired either by fusion welding with cast iron rod or by braze-welding with bronze rod. Almost all metals, such as aluminum, stainless, monel, and nickel, can be welded. Any time it is determined that a piece of equipment made of one of these special alloys will give better service life, there need be no hesitancy in adopting it, because it can be maintained by the oxy-acetylene process.

The oxy-acetylene process can also be used for flame-hardening, or in some cases, flame-softening and flame-strengthening. It can also be used for removing paint and scale from old steel so that the



surface is excellently prepared for repainting. Even though the oxy-acetylene process has been in use for many years, the scope of its use is being broadened continually.

Typical Day With The Maintenance Crews

NO. 1—A nail machine frame is being bronze welded in the welding shop —

only torch preheating is required.

NO. 2—Here's an interesting job that saves Republic Steel considerable money in the flame hardening of gears. This is a tractor type cutting machine which supports the equipment and controls the speed of travel. The gears are first finish machined and then flame hardened. The operation is simple and consists of heating the teeth to a predetermined temperature and then quenching with water. This results in a treated zone varying up to approximately $\frac{1}{8}$ in. depth of hardened metal, which resists wear for approximately three to four times longer than an untreated gear.

NO. 3—This rigger is fusing a wire rope so that the strands will be welded together and not become unraveled. All crane cables are cut and processed in this manner.

NO. 4—Here are several types of gears that are regularly flame hardened—coke plant pusher drive gears of SAE 1035 and tilting table gears for the 112 in. plate mill. The bevel gears like the one being hardened are SAE 4340 alloy for the blooming mill table rolls. These table rolls are shown in NO. 5 receiving a slab rolled from a 48 in. square ingot on the 7000 hp blooming mill.

NO. 6—Many wearing parts are hard-surfaced with special rods, such as the chromium-cobalt-tungsten type rod. This operator is applying this particular rod to ingot tong bits. The alloy is used because the joints come in contact with hot ingots as shown in NO. 7. The chromium-cobalt-tungsten alloy retains its hardness even though subjected to the high temperatures involved. Its value is especially apparent when charging cold ingots and removing hot ingots.

NO. 8—Acetylene powder cutting equipment is another valuable maintenance tool. By introducing an iron and aluminum powder mix into the reaction zone, it is possible to cut up refractory metals, such as cast iron, brass, bronze, copper, stainless and sand encrusted castings. Operator in this illustration is removing a riser from a brass casting.

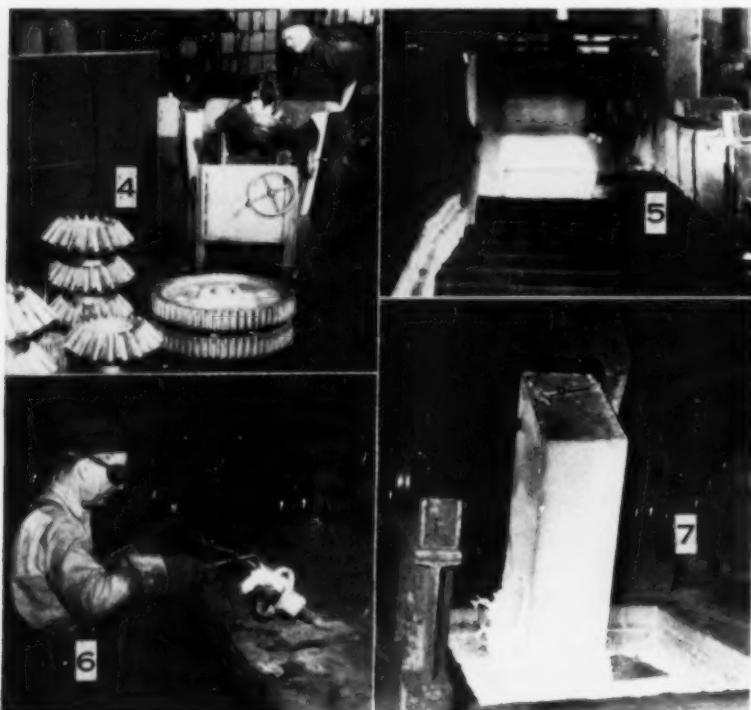
NO. 9—Here's the method used in the pipe mill to accomplish considerable savings by hard surfacing the welding rolls with the oxy-acetylene applied chromium-cobalt-tungsten rod. These rolls, which formerly wore rapidly under the action of heavy pressure, mill scale, high temperature and an abrasive welding flux, are now resurfaced four to five times, giving a total life of about fifteen times that of a hardened alloy steel roll.

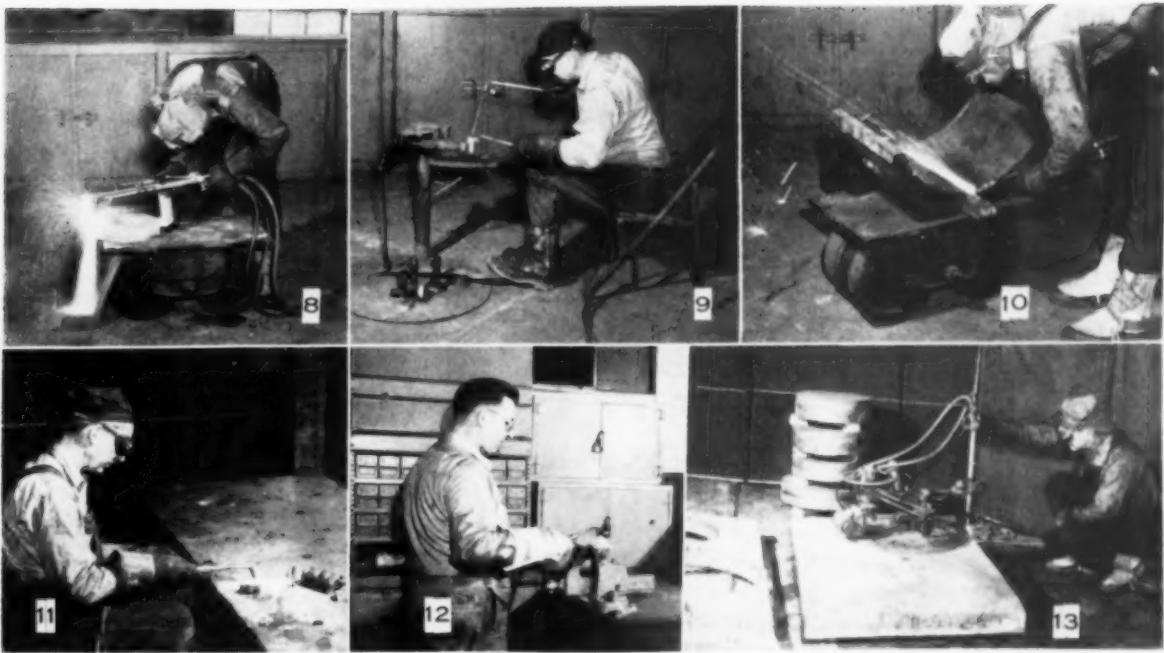
NO. 10—When equipment fails in service, it is often necessary to weld it and get it back in service as quickly as possible. However, before the welding can be performed, the fracture must be properly prepared. In a great majority of the cases, the acetylene gouging apparatus is used to remove the metal in the form of a "U" so that the resultant weld will be completely solid. The acetylene gouging technique is very flexible and is probably fifteen to twenty times faster than pneumatic chipping guns. The gouging process is also valuable in removing defects in castings and welds. In the illustration, a cracked plate mill bearing is being gouged after having been welded on the reverse side.

NO. 11—Operator is using a hard-surfacing rod on straightening machine wire mill guides. Here again, the chromium-cobalt-tungsten type rod is used due to its excellent wear resistance.

NO. 12—Another job performed by the apparatus repair department is the brazing of tungsten carbide bits to tool shanks for special jobs. Here the acetylene flame performs the job best because of its speed.

NO. 13—Gear blanks of various sizes are cut from various thicknesses of material by portable cutting machines. These gear blanks can be cut very





rapidly, with a labor cost only one tenth that of a forged blank and a quality better than that of a cast blank.

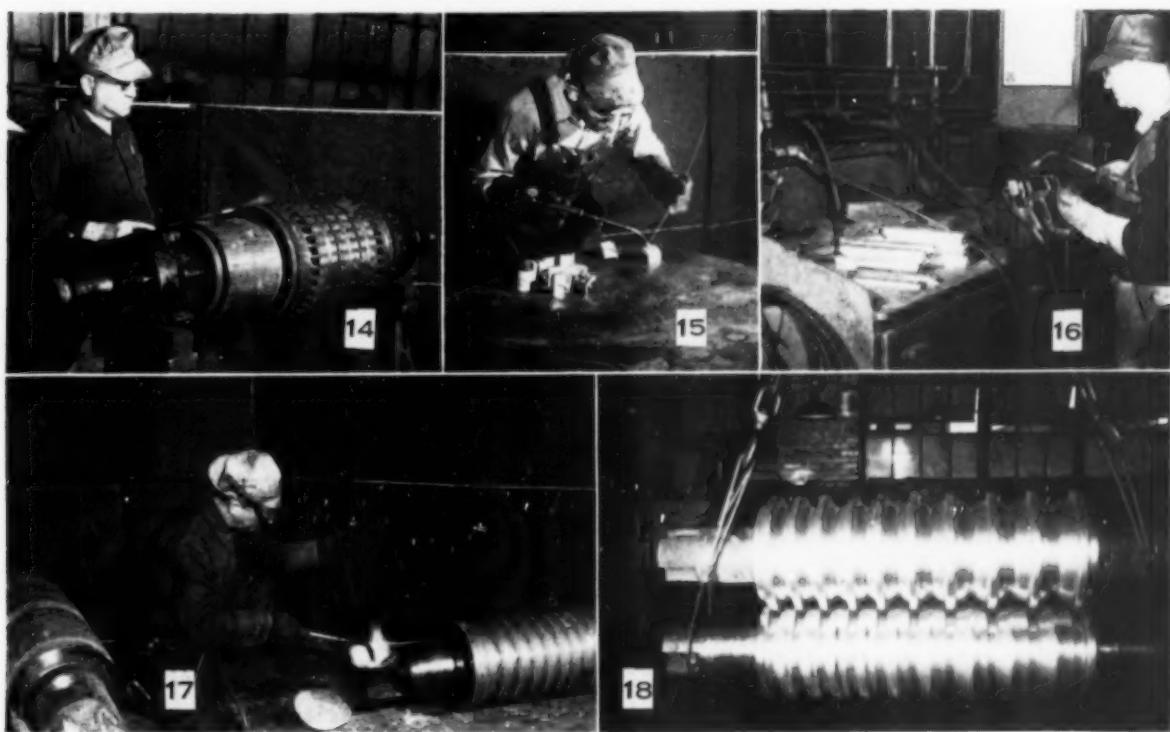
NO. 14—The acetylene flame is used in many ways in the electric shop. This operator is soldering on a commutator of a mill motor.

NO. 15—Brass studs are being silver soldered in the back of the contact tips for the blast furnace skip hoist controls.

NO. 16—Copper chill bars used in large diameter pipe production were originally made by drilling cooling water passages in solid copper bars. After only one-third of the copper was worn off the water passages became exposed and the bar had to be scrapped. In the method illustrated, milled out steel plates are soldered to solid copper bars by oxy-acetylene, enabling Republic Steel to use nearly all of the copper with a resultant saving in copper. The steel part

of the bar is used over and over so the cost of making a chill is obviously less.

NO. 17—The cast iron welding of bar mill rolls requires considerable preheat. Wobblers are built up by skilled oxy-acetylene operators so that no machining or grinding will be required. Roll surfaces are also built up—NO. 18—when a small section is broken out. On these two jobs oxy-acetylene welding is the only method of repair used.



What Does an Employee Owe his Employer . . . ?



By **GUY B. ARTHUR, JR.**, President,
Management Evaluation Services, Inc., Toccoa, Georgia

Any present day, progressive answer to the question of employee-employer relations must be based on equal considerations of both sides

THE non-progressive idea that employees are subservient to their employer embraces the thought that employees should do anything they are told to do; that their time belongs to the boss, to use (or abuse) as he sees fit; that the employer may provide for employees as he desires; and that employees should be grateful for whatever they receive.

Rugged Individualists

This is the philosophy which was commonly prevalent through the twenties. Long hours of work were accepted as being part of a job. There was no such thing as additional pay for working overtime, for working holidays, or even for additional production. The better employers practiced paternalism. Some even donated groceries to their regular employees when steady work was not available. Those were the days when employees went to work in the morning and a superintendent or foreman picked out those who were to work that day—the rest went back home. It was felt, of course, that those who got work should be

thankful—and those who trudged home should have no complaint.

Employers, of that day, thought employees owed them for the privilege of working and for all the employees were able to get out of life. I have actually heard an employer brag, when we passed a row of "dumpy" houses, that he made it possible for his people to buy homes. The truth is that he was selling employees those shacks at a nice profit—and some of them could barely live after he took his payments out of their small earnings.

Changing Conditions

Meanwhile, a lot of progress was taking place in the fields of production and distribution. The automobile industry led the way by means of mass production and low costs. This brought about the need for increasing production per man-hour. It was soon found that a man could do enough more per hour in eight hours that it was uneconomical to work him ten or twelve hours. It was also learned that a man did better work if he rested at least one day out of the week. (Note: Too many employers did not believe the Bible. Some still don't.)

At this point, competition for good workers was bringing about other changes in management's thinking. Incentive and commission

plans, which would reward the more productive workers, started to receive a lot of attention. The seniority rights of workers was recognized by the more progressive employers when layoffs were necessary.

Some companies even encouraged their workers to speak up when they had something on their minds. Group insurance was provided by some owners for those people who worked for them. A few companies even adopted profit sharing and bonus plans. Time and one-half pay for overtime work was offered by many employers as an extra inducement. All of these things were started as a means of attracting and holding good workers.

Unfortunately too few employers were keeping abreast of the progress in employee relations as induced by mass production and distribution, and the law of supply and demand (not recognized by all) was responsible for a terrific letdown in business.

Two forces then proceeded to further change our ideas as to what employees owe their employer. The first force was the then current government administration. Legislation compelled many companies to pay extra for any overtime work. Other legislation made it possible for employees to draw pay (unemployment compensation) for not

NAVCO "Universal" PIPE SUPPORTS

Insulated

Vertical adjustment up to $2\frac{1}{2}$ inches can be made.

Support may be turned to any angle of 360° .

Will take care of 8 inches of travel.



NAVCO PIPING

NATIONAL VALVE & MANUFACTURING COMPANY • PITTSBURGH, PA.

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Features

Universal Pipe Supports hold the pipe down as well as up. They prevent pipe from getting out of alignment, which is usual when Roller Supports are used.

They permit control of expansion movement and insure the desired free action of Slip Expansion Joints so essential in tunnel and duct work.

Expansion movement of pipe will not disturb the insulation.

Made in Cast Iron or Steel and provided with forced lubrication for lines exposed to the weather.

working. The government provided "made-work" jobs, where quantity and quality of work was not required, for many people. Old Age Benefits were established for those in their later years.

All in all, these things brought about the "something for nothing" philosophy of working people. The old idea of working hard, saving, and providing for one's self was "gasping for breath."

Union Influence

The next major force which brought about changes in our thinking was unionization. The unions capitalized on the mistakes of management. They offered protection against further abuses by means of seniority, grievance, time and one-half, and other contract provisions. They were able during those trying thirties to influence politicians so that unions were protected (even encouraged) by the government. The times, the unions, and the government all had a hand in bringing about the new phase of "What Does An Employee Owe An Employer."

Employer Obligations Accepted

This phase brings in the idea that the employer owes something to his employees. Many management men started to accept this viewpoint for the first time in the latter part of the depression. There was a lot of talk that employees should give "a fair day's work and get a fair day's pay." This was a lot different from the old idea that employees had to turn out the work regardless of what the boss paid. Time and a half was adopted by more and more companies even if they were not covered by law. Employees were paid for not working (holidays, vacations, reporting pay, waiting time, etc.). Bonuses were offered by some companies for regular and punctual attendance. Many firms started to pay employees for their suggestions.

All of these things are the result of progress — whether we agree with them or not. They are accepted by the majority as being right. We can fight them if we wish, on the premise that we were not raised that way, but the tide is too strong. The employee is not obligated to his employer in the same manner he was thirty years ago.

Recognize Both Sides

Any present day, progressive answer to the problem of employee-

employer relations must recognize both sides. When we approach it that way we can use the following as a guide:

Guide to Good Relations

1—Fair Work, Fair Pay

An *employee* owes his employer his best efforts for every minute he is paid. (His best efforts to include good quality of work as well as the best output he can easily maintain.)

In return, the *employer* owes the employee a fair rate of pay and good supervision. (Fair rate of pay to be equal to that paid for the same work in that area — good supervision to include fair treatment, proper instruction and understanding.)

2—Honesty

An *employee* owes his employer the utmost in honesty at all times. (He shall not steal, lie or cheat his employer, fellow employees, customers or suppliers under any condition.)

The *employer* owes it to his employees to set an example of honesty and to be sure his subordinates do likewise.

3—Cooperation

An *employee* owes his employer his full cooperation. (This means that he will cooperate not only with the boss but with all employees.)

The *employer* owes it to his employees to see that all of his department heads cooperate so that employees can enjoy working together. (He will eliminate from any group any employees who cause friction.)

4—Orderliness

An *employee* owes his employer orderliness and cleanliness in his habits and behavior. The *employer* owes his employees a healthful, sanitary and

orderly place in which to work.

5—Safety

An *employee* owes it to his employer (and to his fellow workers) to practice safe working habits at all times. (He should never endanger the well-being of other employees nor the property of his employer.)

Every *employer* owes it to his employees to provide safe working conditions, tools and equipment.

6—Promptness

An *employee* owes it to his employer to report for work promptly on every scheduled working day.

The *employer* should provide, in turn, steady full-time work for all of his regular employees.

7—Understanding

An *employee* owes his employer the courtesy of giving him adequate advance notice of any absence or of his resignation.

An *employer* owes it to his employees to have all rules and policies clearly understood—and to give adequate advance warning before any disciplinary action is taken.

8—Grievances

An *employee* owes it to his employer to let him know when he has a complaint or grievance regarding his job.

The *employer* owes it to his employees to keep them informed (so as to create maximum understanding) and to correct any justified grievances employees may have.

If you will approach the problem of employee-employer obligations on the above outlined basis you will do much to improve relationships. This modern, progressive approach is based upon principles laid down in the Bible and in the Constitution of these great United States.

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Centrifugal Blower Formulas

For Easy Solution of Application Problems

ENGINEERING applications of centrifugal blowers often require finding the pressure and volume of the gas delivered and the horsepower required by the motor after the speed of the blower, inlet gas density, and inlet temperature have been changed. Although the laws relating these variables are simple, it is often hard to find the useful formulas because they do not appear in the same reference sources. To simplify the solution of mathematical problems arising with the application of centrifugal blowers, the fundamental engineering laws have been compiled for easy reference.

In the following formulas these symbols are used:

P—Pressure in pounds per square inch (psi) or inches of mercury column (inches Hg)

V—Volume in cubic feet per minute (cfm)

N—Speed in revolutions per minute (rpm)

D—Density in pounds per cubic foot (lb/cu ft)

H—Height of air or gas column (ft)

SG—Specific Gravity (ratio of density of gas to the density of standard air)

Standard Air—Air at 68°F and 29.92 in. Hg.

Variation of Blower Speed

Changing the speed of a centrifugal blower influences volume, pressure and horsepower input according to three laws:

(1) The volume changes in direct ratio to the speed.

EXAMPLE: Given a blower operating at 1750 rpm and delivering 1000 cfm. If the speed is increased to 3500 rpm, what is the new volume?

By O. W. ACHESON

Billmyre Blower Division
Lamson Corporation, Syracuse

Let V_1 = original volume (1000 cfm)

V_2 = new volume

N_1 = original speed (1750 rpm)

N_2 = new speed (3500 rpm)

$$V_2 = V_1 \times \frac{N_2}{N_1} = 1000 \times \frac{3500}{1750} = 2000 \text{ cfm}$$

(2) The pressure changes as the square of the speed ratio.

EXAMPLE: Given a blower operating at 1750 rpm and delivering air at 1 lb pressure. If the speed is increased to 3500 rpm what is the new pressure?

Let P_1 = original pressure (1 psi)

P_2 = new pressure

$$P_2 = P_1 \times \frac{N_2^2}{N_1^2} = 1 \times \frac{3500^2}{1750^2} = 1 \times 4 = 4 \text{ psi}$$

(3) The horsepower changes as the cube of the speed ratio.

EXAMPLE: Given a blower operating at 1750 rpm and requiring a 5 hp motor. If the speed is increased to 3500 rpm what is the new horsepower required?

Let hp_1 = original horsepower (5)

hp_2 = new horsepower

$$hp_2 = hp_1 \times \frac{N_2^3}{N_1^3} = 5 \times \frac{3500^3}{1750^3} = 5 \times 8 = 40 \text{ hp}$$

Inlet Density—Outlet Pressure

The outlet pressure of a blower depends on the condition of the air or gas at the inlet. The inlet condition is influenced by: (1) specific gravity, (2) altitude (location of blower), and (3) temperature of inlet air.

(1) Pressure varies in direct proportion to the density.

EXAMPLE: A 3 psi (standard air) blower is to be used to handle gas having a specific gravity of 0.5. What pressure does the blower create when handling the gas?

Let P_a = air pressure

P_g = gas pressure

SG = specific gravity of gas (0.5)

$$P_g = P_a \times SG = 3 \times .5 = 1.5 \text{ psi}$$

If we are required to handle a gas having a specific gravity of 0.5 at 1.5 psi pressure, we can determine the standard air pressure blower as follows:

$$P_a = \frac{P_g}{SG} = \frac{1.5}{.5} = 3 \text{ psi}$$

(2) Pressure varies in direct proportion to barometric pressure.

EXAMPLE: A blower is to operate at an elevation of 6000 ft (barometric pressure 23.79 Hg)* and is to deliver 3 psi pressure. What pressure (standard air) blower is required?

$$\text{Pressure} = 3 \times \frac{29.92}{23.79}$$

= 3.77 or about 3 $\frac{3}{4}$ psi

If it is desired to determine what pressure a 3 psi (standard air) blower will deliver at 6000 ft altitude—

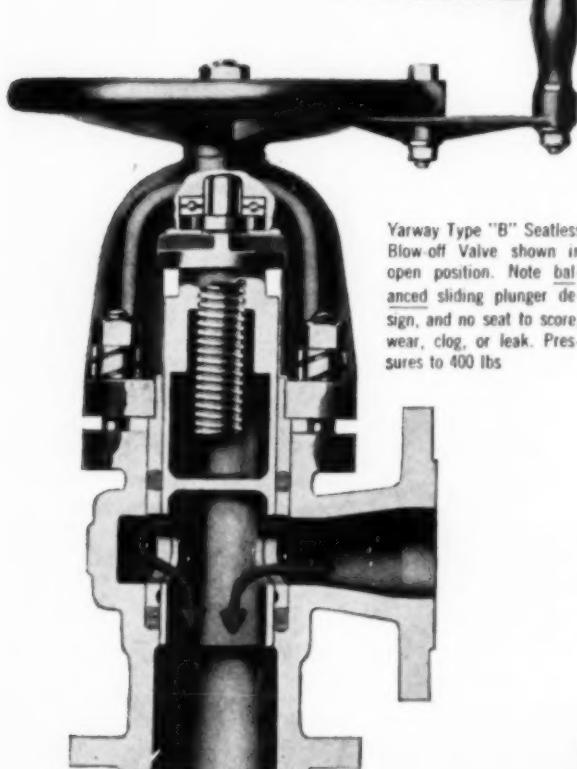
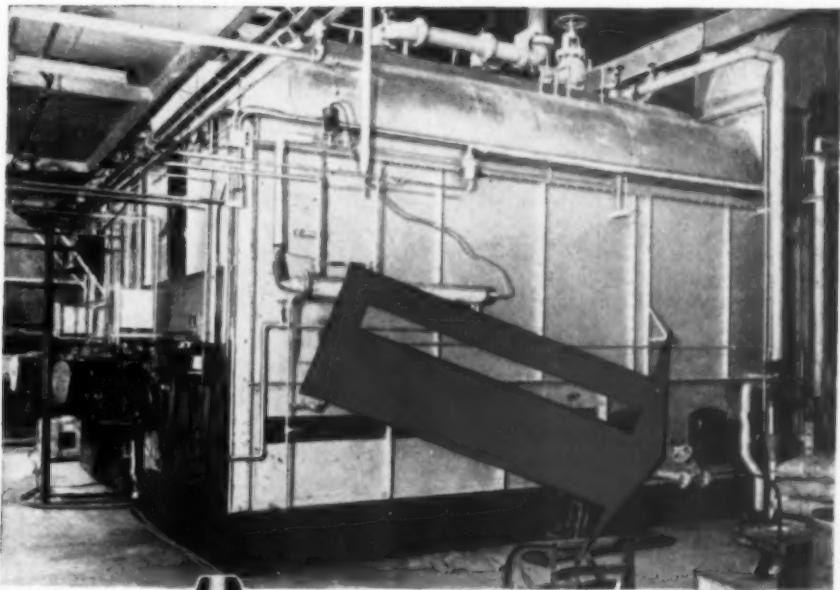
$$\text{Pressure} = 3 \times \frac{23.79}{29.92}$$

= 2.38 or about 2 $\frac{1}{3}$ psi

(3) Pressure varies in inverse proportion to the inlet temperature. The air density varies in inverse proportion to the absolute temperature (absolute tempera-

(Continued on page 76)

THIS ERIE CITY "PACKAGE" INCLUDES A YARWAY SEATLESS



Yarway Type "B" Seatless
Blow-off Valve shown in
open position. Note bal-
anced sliding plunger de-
sign, and no seat to score,
wear, clog, or leak. Pres-
sures to 400 lbs.

■ The above installation of two 300 hp. Erie City VL type boilers at a Detroit automotive plant shows Yarway Seatless Blow-off Valves as part of the "package" picture.

Good package-type boilers are *better* when equipped with Yarway Blow-off Valves.

Get the advantages that have made Yarway Blow-off Valves guardians of blow-down lines in more than 15,000 boiler plants. On your package boilers—whatever the make—high grade blow-off valves pay off in dependable, trouble-free service.

Write for Yarway Bulletin B-426.

YARNALL-WARING COMPANY

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YARWAY

SEATLESS BLOW-OFF VALVES

Centrifugal Blower Formulas

(Continued from page 74)

ture is obtained by adding 460 to the Fahrenheit reading).

EXAMPLE: A blower is to handle 200 F air at 3 psi pressure. What pressure (standard air) blower is required?

Let P_1 = pressure hot air (3 psi)

P_2 = pressure standard air

AT_1 = absolute temperature hot air (660°)

AT_2 = absolute temperature standard air (528°)

$$P_1 = P_2 \times \frac{AT_1}{AT_2} = 3 \times \frac{660}{528}$$

$$= 3.75 \text{ or } 3\frac{3}{4} \text{ psi}$$

A blower is capable of delivering 3 psi pressure with standard air. What pressure will it develop handling 200 F inlet air?

$$P_1 = P_2 \times \frac{AT_2}{AT_1} = 3 \times \frac{528}{660}$$

$$= 2.4 \text{ or about } 2\frac{1}{4} \text{ psi}$$

The horsepower varies in direct

Barometric Pressure for Various Altitudes

Altitude (ft)	Barometric Pressure (in. Hg)	Altitude (ft)	Barometric Pressure (in. Hg)	Altitude (ft)	Barometric Pressure (in. Hg)
(Sea Level)	29.92	3400	26.28	6000	23.79
1000	28.80	3800	25.88	6600	23.26
1500	28.26	4200	25.49	7200	22.73
2000	27.72	4800	24.91	7800	22.21
2500	27.20	5200	24.53	8400	21.70
3000	26.68	5600	24.16	8800	21.37

proportion to the specific gravity of gas at inlet.

EXAMPLE: A standard air blower requires a 10 hp motor. What horsepower is required when this blower is to handle a gas whose specific gravity is 0.5?

$$\text{hp} = 10 \times 0.5 = 5 \text{ hp}$$

The volume varies in inverse proportion to barometric pressure.

EXAMPLE: A blower is to operate at 6000 ft altitude (barometric pressure, 23.79 in.) and

is to handle 1000 cfm of standard air. What is the cfm of air the blower must handle at 6000 ft altitude?

Let V_1 = volume of standard air (1000 cfm)

V_2 = volume of thinner air

Hg_1 = barometric pressure sea level (29.92)

Hg_2 = barometric pressure at 6000 ft (23.79)

$$V_2 = V_1 \times \frac{Hg_1}{Hg_2} = 1000$$

$$\times \frac{29.92}{23.79} = 1255 \text{ cfm}$$

Busy Future Assured for "Lazy" Gas

Argon, a fabulous "lazy" gas that has gone to work for industry, is now being commercially extracted at the Houston Oxygen Company's million dollar plant in Houston.

The colorless, odorless, and tasteless gas is being bottled in large scale production for specialized welding operations. The gas is also used for filling light bulbs, fluorescent and neon tubes.

The Houston Oxygen Company's argon plant, the only one in the South, works in connection with its liquid oxygen and nitrogen production. (See SP&I, June '52, pages 78-81 for complete semi-technical description.)

Since the atmosphere contains .9% argon, it is a matter of rectifying the air and breaking it up into its components which are principally nitrogen, oxygen and argon.

The air is filtered and compressed through five stages to 2350 pounds per square inch. As it passes through an expansion engine, the air is reduced in temperature to 170°C .

The air then goes into a huge, towering rectification column where it is liquefied and broken down and the components are removed at various levels.

The crude argon gas goes through the tower a second time before it is poured into a giant balloon suspended from the three-story ceiling. From there it is funneled to the purifying plant.

The first two refining processes remove all but a trace of oxygen. The final step sends the impure argon into a furnace where hydrogen is introduced to combine with the oxygen to form moisture which is drained off. This leaves the argon 99.92% pure, in its most refined state. Argon is the heaviest gas that is commercially bottled.

Its largest potential use now is in welding where it is flowed over the electric arc to exclude chemically active gases from contact with the molten metal.

Inert gas metal-arc welding has several advantages over gas welding, such as a greater adaptability to welding the aluminum-zinc alloys, higher welding speeds, ability to weld thicker material and less distortion.

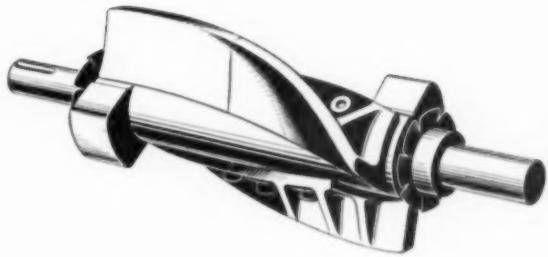
Argon provides a better cleaning action for aluminum and magnesium when welding with an alternating current. Under similar welding conditions less argon is required than any other



Argon gas is "poured" into this giant balloon suspended from the three-story ceiling at the Houston Oxygen Company.

inert gas and it provides a more stable arc.

Aluminum and magnesium are now being welded with an inert gas shield because of high weld quality and low overall cost. By using the inert gas process, practically all metals can be welded without the use of flux.



How to make a stoker with Perfect Spread

WHETHER YOU PLAN to buy a new unit or to re-stoker an old one, it must be engineered to assure top efficiency with both low and high ash coals. And a prime requisite for such efficiency is *even* coal distribution over the entire grate... the perfect spread that is provided only by American Engineering's unique spiral overthrow rotor.

Supplementing that, you need the exclusive Perfect Spread traveling conveyor feeder that *won't clog... not even on wet coal*. This feeder operates on a high traction principle that provides true, *continuous* feeding throughout its whole range of 50 to 7500 lbs. of coal per hour. And for maximum combustion... most steam per fuel dollar... the special AE cinder return and adjustable overfire air system are unsurpassed.

Perfect Spread Stokers are available in a wide choice of

sizes, capacities and grate types. Ask to have an American Engineering Company representative call and discuss your exact requirements.



**AMERICAN ENGINEERING
COMPANY**

2421 ARAMINGO AVE., PHILADELPHIA 25, PA.
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AE Products are: Taylor and Perfect Spread Stokers,
Marine Deck Auxiliaries, Hele-Shaw and Hydramite Fluid
Power, Lo-Hed Hoists, Lo-Hed Car Pullers.

FIRE SAFETY PROVISIONS

American Enka's Lowland, Tennessee, Plant

INDUSTRIAL plants today are placing more and more emphasis on fire safety construction, procedures and extinguishing equipment. Corporations realize that a serious fire can inflict damage or loss to plant, inventory, and life that no insurance policy can fully cover. A fire safe plant, in addition to minimizing down time and losses, frequently reduces insurance premiums.

When the H. K. Ferguson Company's industrial engineers designed and constructed American Enka's plant at Lowland, Tennessee, no expense was spared to provide that rayon yarn manufacturer with as fire safe a plant as today's ingenuity permits.

Fire Safe Plant

To safeguard the valuable plant

Plant construction, extinguishing equipment, and personnel training merged in program. Special automatic carbon dioxide system for generators.

against damage by fire, Ferguson employed fire resistant materials such as concrete, red brick, aluminum or steel wherever possible. Double insurance was provided by water sprinklers all areas of the plant except for several rooms where water would do more damage than a confined fire could, or where water would only spread the blaze.

Portable Equipment

First aid fire fighting extinguishers were provided by the company at a host of locations throughout

the plant. Almost three hundred portables and wheeled units are available for emergency use. They are all tagged with "how to use" and "on what type of fire" labels.

Particular care went into placing foam and water units in areas likely to experience blazes in ordinary combustible materials; carbon dioxide and dry chemical portables in spaces containing flammable liquids; and dry chemical, carbon dioxide, or vaporizing liquid in rooms housing electrical equipment.

A particular problem arose when



Testing the operation of self-closing fire doors (left) is part of the plant's fire safety program. Right, an American Enka guard weighs a Kiddie carbon dioxide portable extinguisher on a routine check. Periodically all plant extinguishers are inspected to be sure that they are ready for first aid fire fighting in an emergency.

WHEN IT'S LIQUID LEVEL CONTROL



LEVEL-TROL

...the Accepted Standard

for a liquid level controller that is high in sensitivity and accuracy, versatile in handling all kinds of liquids, ruggedly built, easy to operate and simple to maintain.

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WORLD LEADER IN RESEARCH FOR BETTER PRESSURE
AND LIQUID LEVEL CONTROL

American Enka considered fire protection for its electric generators in the plant power house. Here, because of the high dollar value and necessity of electricity for continued plant operation, special fire safeguards were designed.

The company presented its problem to Walter Kidde & Company Inc. Kidde engineers designed an automatic carbon dioxide system for the generators.

Each of the generator's air cooling systems has single-pole, fixed-temperature thermostats. Unusual heat conditions (indicating fire) cause these elements to close the electrical circuit. Closing the line turns the proper directional valve and trips eight 50 lb cylinders of carbon dioxide; the fire smothering liquid rushes from the cylinders, through the directional valve, and is carried through pipes to the generator in trouble. There it is introduced into the air cooling system as an inert gas from Multijet nozzles flanged into the duct housing and is distributed to every part of the generator. Thus, oxygen in the recirculating cooling system is decreased to a point insufficient to support combustion; the fire is smothered in seconds.

As the electric generators take forty-five minutes to stop rotating, and the 972 cu ft static air volume of the cooling system must be kept inert during this period, a special cylinder discharge pattern was developed. Instead of all eight cylinders being dumped simultaneously, only two cylinders are released initially which creates an inert atmosphere. The remaining 300 lb of carbon dioxide are introduced slowly in order to maintain the concentration during the deceleration period.

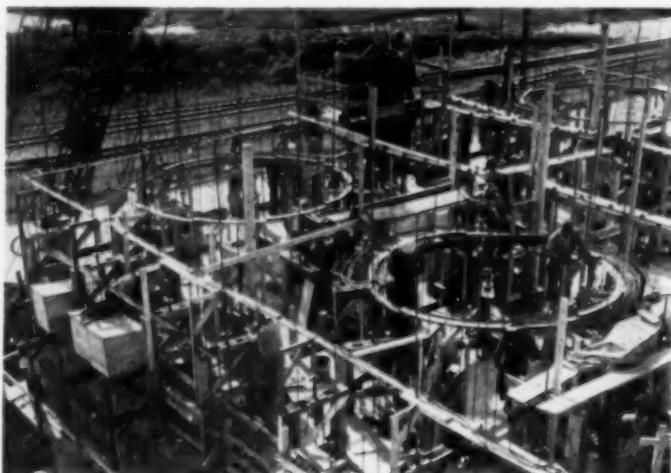
While the system normally stands automatic fire guard, provision was made for manually actuating the system. At two locations in the power house are remote control stations consisting of a manual switch case and two indicating lights, one green showing that electrical power is available to operate the system, and one red warning that the system has been expended.

Besides prompt extinguishing action, carbon dioxide provides a number of other advantages which

American Enka finds particularly appealing. Being an inert gas it is a non-conductor of electricity and cannot damage the generators, motors, or electrical wiring. Finally, following discharge it eventually dissipates into the atmosphere leaving no mess to be cleaned up.

American Enka knows that no

extinguishing equipment operates better than the men available to man it. So weekly fire training drills and practices are conducted on each shift for all members of the volunteer fire fighting department. Each shift has its own fire fighting crew composed of the Guard Sergeant (in charge), two guards, and three other employees.



About one-third of the way up—view of the new bleach plant “sliding up” for Hollingsworth and Whitney’s pulp and paper mill at Mobile, Ala., shows how the Rust Engineering Company “poured” the entire structure including columns and 9 bleaching towers all at the same time using the sliding form method of concrete construction.

Walls and Towers of Mobile Plant Constructed in One Continuous Pour

PROCESS DATA

In this method of construction, one-inch rods are set vertically among the reinforcing rods in the concrete at intervals. A screwjack mounted on a yoke climbs each special jack rod by means of dogs. As the screwjack is turned it pulls up the yoke which hauls up an attached wooden form and working platform.

Rate of climb depends on rate the concrete sets—slower on a cool wet day, and fast on a hot dry day. The 20 ft jack rods are continuously extended by a pipe sleeve arrangement as the walls go up. Height of rods is carefully staggered for strength and continuous operation.

A new bleach plant—the first where the building as well the bleaching towers were built by the sliding form method of concrete construction—has been completed at the HOLLINGSWORTH AND WHITNEY COMPANY paper mill in Mobile, Ala., according to THE RUST ENGINEERING COMPANY, the designer-constructor.

The new unit undertaken in Hol-

lingsworth and Whitney’s modernization and expansion program, will increase the mill’s existing bleach stock capacity by 150 tons per day.

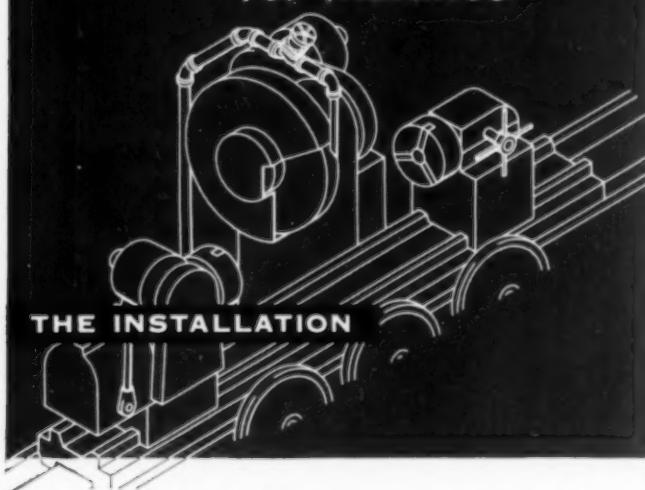
The six-story bleach building was poured by the sliding form method in ten days, including columns and nine bleaching towers which went up with the walls.

The building was literally hauled up by its own screwjacks in a continuous lift operation. Rust engineers estimate the sliding form method is nearly ten times faster than similar construction with fixed or so-called movable forms.

The extent of this type construction at the new Hollingsworth and Whitney bleach plant may be judged from the height of the walls which were 77½ ft. The nine bleaching towers themselves averaged 14 ft in diameter and 60 ft high. They reach to the operating floor on the top level of the building.

How this Valve Solved a Costly Problem ... on Abrasive Fluid,

for instance



THE INSTALLATION

At Standard Crankshaft & Hydraulic Co., Inc., Charlotte, N. C., with Crane diaphragm valves on regrinding machines, controlling flow of grinding solution to the work.

THE CASE HISTORY

About 3 weeks was the maximum service life of the conventional globe valves formerly on these machines. Their disc and seat were quickly cut out by the abrasive and steel dust that mixed with the re-circulated lubricant. Keeping up with replacements was costly in valves as well as extended machine down time.

Crane 1610 Diaphragm Valves were selected to help if not remedy the situation. They would last longer. Their pliable Neoprene disc insert would absorb the foreign particles that cause leakage and wire-drawing in ordinary valves. And when needed, a disc could be renewed in a few minutes.

But results were far better than expected. The Crane valves installed more than 6 months ago are still in service with no repairs; show no sign of trouble. Naturally, these valves have been put on all grinders.

THE BETTER QUALITY...BIGGER VALUE LINE...IN BRASS, STEEL, IRON

CRANE VALVES

CRANE CO., General Offices: 836 S. Michigan Ave., Chicago 5, Illinois
Branches and Wholesalers Serving All Industrial Areas

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SOUTHERN POWER & INDUSTRY for SEPTEMBER, 1953

VALVE SERVICE RATINGS

SUITABILITY:

Far better than expected

FEATURES:

Pliable neoprene disc insert

MAINTENANCE COST:

Zero

SERVICE LIFE:

*Now 8 times longer
than other valves*

OPERATING RESULTS:

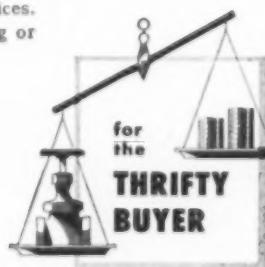
Forced machine down time stopped

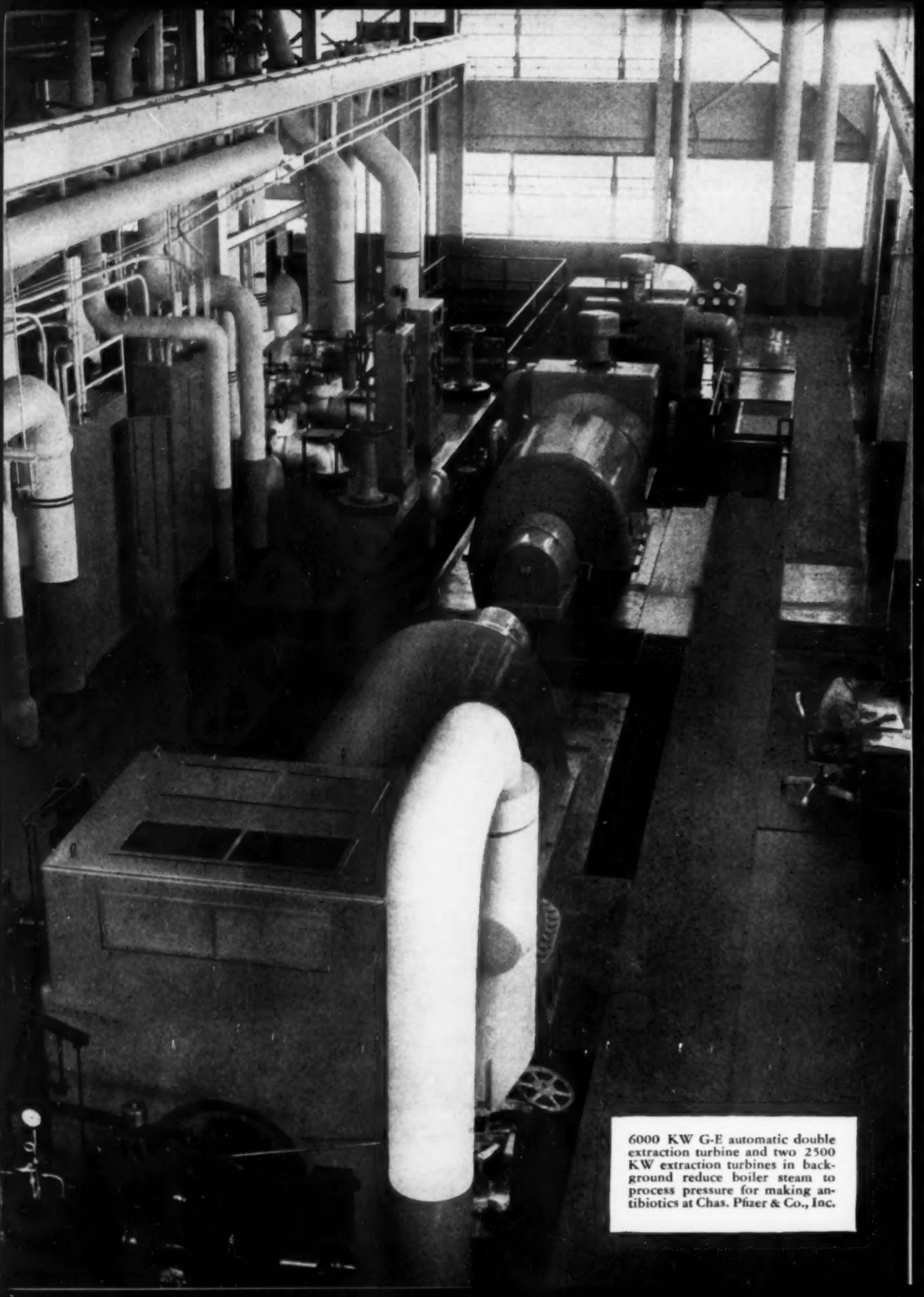
AVAILABILITY:

Crane catalog item - No. 1610

THE VALVE

Neoprene disc insert seating is but one feature of Crane Packless Diaphragm Valves. Their sealed bonnet isolates working parts from line fluid. Independent disc and diaphragm design reduces diaphragm wear; permits closure on fluid even should diaphragm fail. These valves come in many body and trim materials for corrosive, abrasive, or common services. See your Crane Catalog or Crane Representative.





6000 KW G-E automatic double extraction turbine and two 2500 KW extraction turbines in background reduce boiler steam to process pressure for making antibiotics at Chas. Pfizer & Co., Inc.

G-E Extraction Turbine at Chas. Pfizer & Co., Inc. Increases Plant Thermal Efficiency Over 15%

Extraction pressures held constant, even under varying loads; turbines reduce boiler steam to process pressures for use in making antibiotics

Plant thermal efficiency was increased over 15% when Chas. Pfizer & Co., Inc., producer of antibiotics, recently installed the third General Electric automatic extraction turbine-generator at its Groton, Connecticut, plant. A 6000 KW extraction unit was installed to take fullest advantage of available high-pressure steam, and to obtain additional economical by-product power.

PRESSURE HELD CONSTANT

The double automatic extraction turbine takes steam at 725 F, 600 psig, and extracts at 135 and at 50 psig for plant process uses in the making of terramycin and other antibiotics. Chas. Pfizer & Co.,

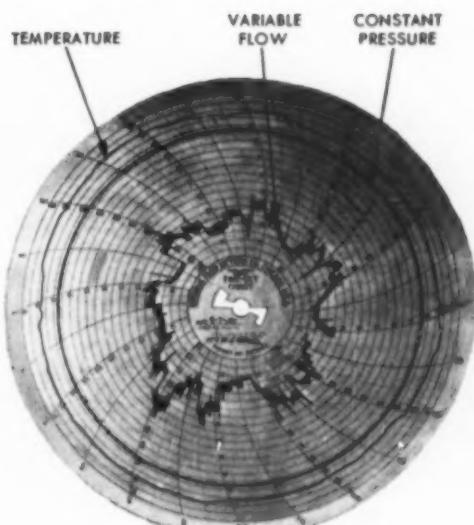
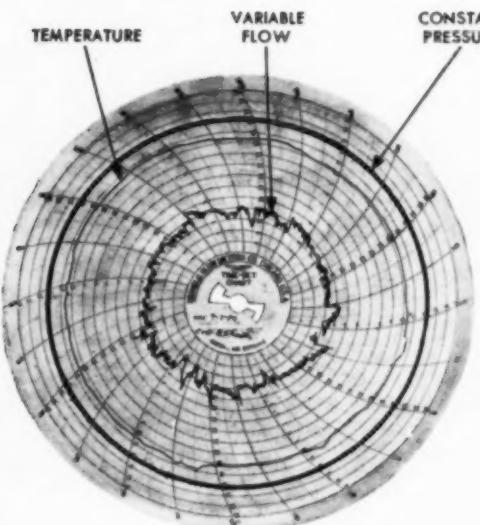
Inc. reports that accurate turbine governing holds electrical frequency constant, and keeps extraction pressures precise, even when the quantity of extracted steam varies. (See charts below.)

If your plant uses process steam, why not take advantage of G.E.'s experienced turbine engineering resources. G-E engineers will study and recommend ways for you to best utilize steam supply. Get more for your turbine dollar with G-E turbine-generators. General Electric Company, Schenectady 5, New York. 256-H



You can put your confidence in—

GENERAL **ELECTRIC**



Even when the quantity of extracted steam varies over wide limits, extraction pressure remains constant, as indicated on the charts above. These charts show typical performance of a General Electric double automatic extraction turbine such as the one installed at Chas. Pfizer & Co., Inc.

**Stud welding techniques pay off in
Alabama plant construction . . .**

Roofing—Siding Installation Methods

Seven man crew averages 104 squares of roofing per day

A NEW speed record for installing corrugated aluminum roofing and siding may have been established on a recently completed building at the Reynolds Alloys Company's Listerhill Works, Sheffield, Alabama.

Employing the Nelweld method, a seven-man crew installed the total of 164 squares (16,400 sq ft) of Reynolds .032 corrugated aluminum on the roof in a single eight-hour day. While this was its peak performance for any one day, the crew averaged 104 squares of installed roofing per day throughout the project, on straight runs which required no cutting. On siding, with a smaller five-man crew, top produc-

tion reached 54 squares in a day on straight runs, with a healthy average of 45 squares per day being posted.

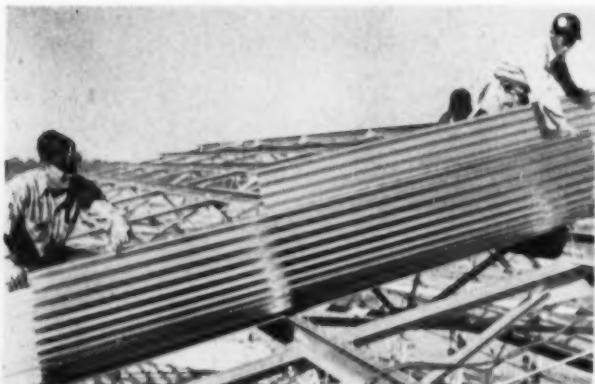
Two Nelweld guns were used by each crew. Working with templates, the welders were able to end-weld the Nelson Composite Rivweld studs to purlins and girts at a rate that kept them well ahead of the sheeters.

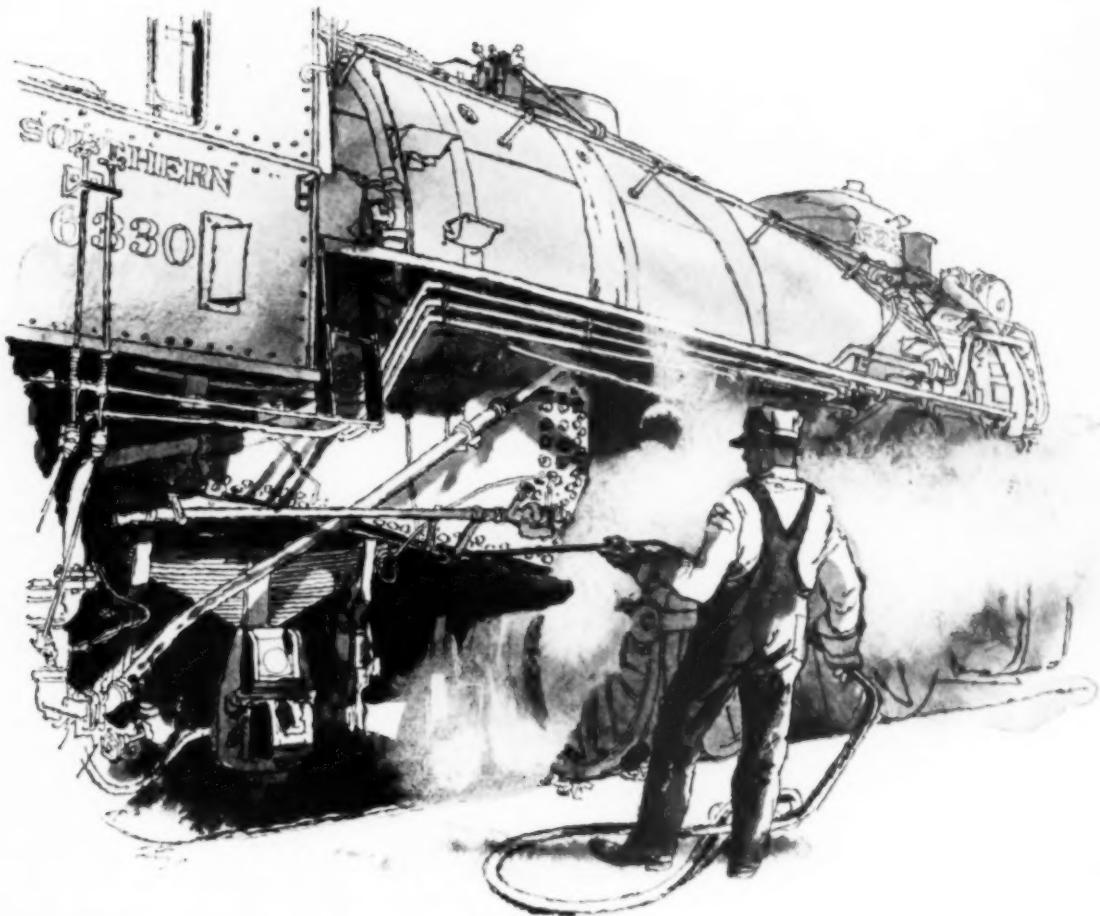
John C. Gassaway & Company of Birmingham was applicator on this 3,300 square project for which Foster & Creighton Company of Nashville, Tennessee, was general contractor.

Right: These two stud welders set the pace on a seven-man roofing crew which installed a total of 164 squares (16,400 sq ft) of Reynolds .032 corrugated aluminum in a single eight-hour day. Using two Nelson stud welding guns, they installed all of the required composite aluminum and steel Rivweld studs on the purlins to prepare the way for the sheeters.

Below: Sheeters found the composite Nelson Rivweld studs already in place, ready for sheeting.

These four members (right) of the seven-man crew handled the sheeting end of the job. They laid the sheets, impaled them over the stud extensions with a blow from the hard rubber end of a hammer and then placed a washer and burr over the stud extension which was permanently fastened with a blow on the rivet set.





He's putting out a fire we started 123 years ago!



THE 8,000-mile Southern is now the largest railway system in the country to be 100 per cent Dieselized. We've "pulled the fire" on our last steam locomotive.

In effect, this fire was started back in 1830—when history-making "Best Friend of Charleston," on a railroad that is now part of the Southern Railway System, became the first steam locomotive to run in regularly scheduled service in America.

Down through the years since 1830, the colorful steam locomotives paced the progress of the South, serving well until they, too, had to step aside for progress.

Today we are serving the South with a fleet of 880 powerful Diesel locomotive units costing \$123½ million. This huge sum—which we will be "paying off" for years to come—marks our faith in the future of the South, and underscores our determination to bring to all in the South a great new kind of railroading—modern, streamlined, better than ever.

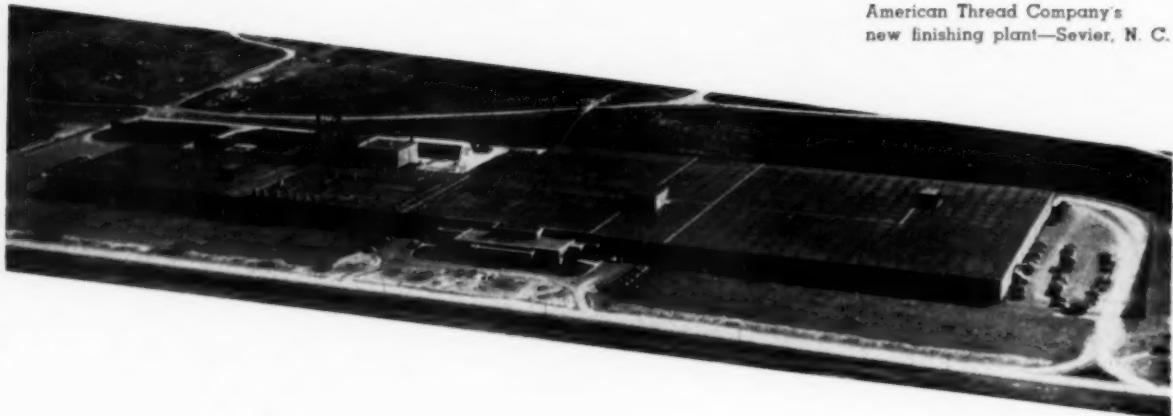


Henry A. DeBartola
President

SOUTHERN RAILWAY SYSTEM

WASHINGTON, D. C.

American Thread Company's
new finishing plant—Sevier, N. C.



WATER TREATMENT

ATCO's Finishing Plant Sevier, North Carolina

THE NEW \$6 million finishing plant of the American Thread Company at Sevier, North Carolina, is nearing capacity production of finished yarn and thread. The plant finishes all types of cotton yarn and thread from ATCO's five spinning mills in the Carolinas and Georgia.

The building is of single story, windowless construction, air-conditioned throughout, and totals 500,000 sq ft in area. Floors are high density concrete, surface hardened, Kalman in heavy duty areas. Dyehouse and humidified operating areas have floor-to-ceiling glazed tile walls—40% of the plant is so constructed.

Of particular interest is the water treatment plant, which is rated at 2,000,000 gpd. Water is taken from Armstrong Creek, just above its confluence with the North Branch of the Catawba River, where a floodproof brick and concrete pump house is located. It is equipped with two pumps, each with a capacity of 1,500 gpm, and a Chain Belt Co. traveling screen to catch leaves and other foreign matter.

Water from Armstrong Creek is comparatively soft, and normally requires only moderate treatment for use in textile finishing operations. During normal periods it has ample flow for the plant requirements; however, during extremely low water periods considerably harder water from the North Branch will be used to supplement the supply from Armstrong Creek. Since this water is normally too hard for finishing operations, softeners are to be installed in the water treatment plant.

After flocculating, precipitating, filtering, and chlorinating, water is pumped to a 1,000,000-gallon concrete reservoir. The reservoir is 80 ft higher than the plant floor, and provides static pressure of about 35 psi. The 1,000,000-gallon capacity provides

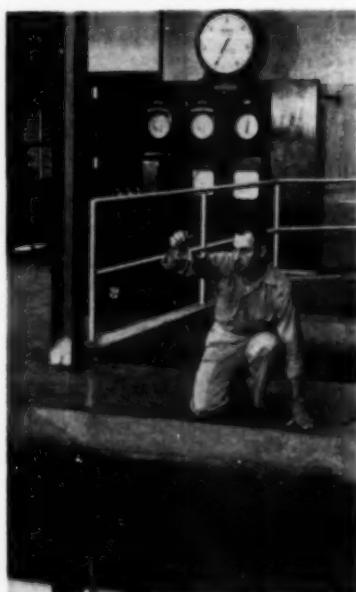
Engineering for the new plant was by J. E. Sirrine Co., Greenville, S. C. Contractor was Daniel Construction Co., also of Greenville. Engineer for American Thread Company's seven Southern plants, including Sevier, is A. Keith Pooser. Local plant engineer is Merrill V. Davis and Harvey Eastman is general manager of the Sevier plant.

500,000 gallons for plant processes, 130,000 gallons for sprinkler system storage, and 370,000 gallons for fire pump use.

Water for drinking, sanitary, and humidification requirements is obtained by post chlorinating water from a clear well in the treatment plant.

Two effluent retention basins, each with a capacity of 5,400,000 gallons, have been constructed, and a sanitary sewage system which meets approval of the N. C. State Board of Health is being installed. While retention basins are expected to provide adequate treatment of plant effluents, by averaging the composition of

(Continued on page 131)



Filtration plant by Roberts Filter Mfg. Co. has capacity of 2,000,000 gpd.

ANACONDA FORUM

for the Electrical Industry

MODERNIZATION AND ELECTRIFICATION— A LOOK AHEAD

by: Maxwell Cole
Manager Market Studies and Service Division
Philadelphia Electric Company
Philadelphia, Pa.



AMERICAN industry, its vision of new products for better living, its ingenuity in developing new methods and materials to make them, and its courage to invest in the facilities to produce them is the cornerstone on which American living standards have been erected. To make more things, faster, better and cheaper so that they may be available to more and more people has been the goal of American industry. Its success in reaching toward that goal has been its outstanding accomplishment.

REPLACING MANPOWER WITH HORSEPOWER

Operating in a free competitive economy, at liberty to develop new products and better ways of making them, American industry has taken full advantage of the opportunities offered by modern, high speed tools powered by electricity to increase its productive capacity, to improve its product and to reduce costs by

replacing manpower with horsepower. Refrigerators and washing machines, automobiles and jet-propelled planes, plastics and stainless steel and many other of today's conveniences, even necessities, would not be available in sufficient quantity or at low enough prices to have become accepted elements of American life but for the readiness of industry to accept new products and new methods and to modernize their facilities to accommodate them. Industry's readiness to streamline production methods and modernize facilities enabled us to snow our enemies of World War II under an avalanche of production.

NEW CHALLENGES

Today, industry faces new challenges. It must produce materials of war in such quantity and of such quality that no enemy dare attack us; it must maintain progress in fields of civilian production; and many people believe we are entering

an era of keener competition than experienced for many years. Industry's ability to meet these challenges depends on its willingness to continue to modernize facilities and keep abreast of progress.

CONTINUED MODERNIZATION LIES AHEAD

We stand only on the threshold of the promises science and industry hold out for our future strides into security and better living. These promises will become realities only as better, more powerful tools are developed for producing them and as industry maintains its courage in investing in them to continue our national progress and replace wasteful or obsolete methods. Contemplating such a vista of promises, with faith that American industry still possesses characteristics which raised it to its present level of greatness, one foresees continued modernization of American factories, processes and products at a pace even greater than it has been in the past.

AMERICA'S CHALLENGE to industry is to meet and sustain an increasingly higher level of production in the face of keen competition. New and better equipment—such as this installation of a 75,000-pound chain drawbench in a Connecticut Mill—is a vital part of expansion and modernization. With each new machine comes the need for increased power and modern wire and cable!



A LOOK AT MODERN



*It was
great sport but . . .*

EVER SEE A STUTZ "BEARCAT" on the road these days? With loving care and a knack for tinkering, hobbyists still keep a few going. They are good cars . . . but hardly economical modern transportation. Now consider how much antique wiring lies around still doing a job . . . of sorts. Hardly efficient. Pathetically unprofitable when pitted against modern power needs. What are we going to do about it? The following article gives some good reasons for re-evaluating our requirements for reserve capacity and replacing obsolete wiring . . . with new and better products.

ONCE MORE it's a case of growing pains! Today industry has already used up its power reserves—though these were considered adequate ten years ago. Now it's time for another upward revision of our ideas of what is a sufficient power margin for operating the new production tools that have been put in our hands. To power them, utilities are now in the process of re-doubling their load capacity. Our stepped-up rate of production and consumption has telescoped the future . . . even beyond the soberly considered estimates of industry leaders as recently as a decade ago!

The link between tool and power source is wiring. New tasks suggest new techniques . . . new tools . . . new power loads . . . new wiring to carry the load. Yesterday's wiring may bottleneck today's production flow.

Some existing plants haven't spotlighted their wiring in many a year. Now—with new production factors in the picture—it is time for a basic survey of wiring. If it's obsolete, replace it . . . and reap the benefits of more efficient power, greater reliability, and longer economy.

Modern wiring has seen a wealth of new developments—especially in insulation. Let's take a quick look at what's been done. It's all interesting, practical and valuable.

RUBBER INSULATION

Modern wiring may be defined as that approved and accepted since World War II. Twenty years ago we spoke of "enormous strides" in such things as rubber compounding. These resulted in superior products. We

ANACONDA was the first manufacturer of wire and cable to use synthetic resin compounds for insulation. One example is DENSHEATH®—a high-grade and super-aging thermoplastic (vinyl resin). This is widely used today for wiring on (1) machine tools, (2) appliances, and (3) various types of signal systems—as well as for control or switchboard, building or general purpose wiring.

*Reg. U.S. Pat. Off.



DEVELOPMENTS IN WIRING INSULATION

ARE WE ASKING OBSOLETE WIRING TO DO TODAY'S NEW JOBS?

can still speak of "progress." There has been lots of it. They are still striding forward—the chemists, metallurgists, cable engineers and their co-workers. The end is not in sight.

Heat is the great enemy of electrical insulation. But today Code Rubber, Type R, does a much better job in withstanding heat than a few years ago. TABLE I shows how this and other rubber compounds compare.

KIND OF INSULATION	MAXIMUM ALLOWABLE CONDUCTOR TEMPERATURE		
	1940	1947	1953
degrees C			
Code, Type R	50	60	60
Type RW	50	60	60
Type RH	75	75	75
Type RH-RW	—	—	75,60**
Heat- and moisture-resistant	60,70,75	75,80	75,80
Ozone-resistant* (ASTM oil base)	70	70,75	70,75
Ozone-resistant* (butyl)	70,75	75,80	80,85

*Temperature varies with manufacturer

**whether in dry or moist location

TABLE I

Type RH-RW is outstanding. This is being used so much now—at little more cost than Type R—that the latter has a narrower market than even just after the war. Ozone-resistant, butyl-base compound is another excellent performer. Its stability, long aging, low power factor and other desirable physical and electrical properties under severe operating conditions make it a dependable compound for voltages up to 15 kv and sometimes higher. Several manufacturers supply it.

During World War II natural rubber was out. Synthetic (G-RS) rubber took its place. In just a few years, cable manufacturers found many things in its favor . . . so many, in fact, that the natural product is disappearing as a wire and cable insulation. "Cold" rubber is another development. Coming fast into regu-



Brrr...
now I'm cold!

lar use, it brings improved physical and electrical properties to low-voltage cables.

Another forward stride is the pre-war development and post-war application, in great quantity, of neoprene jacketing for rubber-insulated cable. Dependable under many severe conditions, relatively inexpensive, it is excellent in moist or dry conduit, direct burial, in aerial and other locations.

THERMOPLASTIC INSULATION

You can do a modern wiring job today with materials barely existing or unknown as late as just before World War II. These are the thermoplastics. Two stand out as basic insulations: polyvinyl chloride (vinyl resin and one or more of its co-polymers, which appear under various trade names) and polyethylene.

Polyethylene is a remarkable insulation for many purposes. It made radar possible. Now, however, the real workhorse of the industry is the first—PVC for short.

Millions of feet of PVC are used annually for wiring houses, stores, office buildings, by the armed forces and in many industrial applications. It resists many enemies of insulation: oil, moisture, acids, alkalies, abrasion, greases, and gasoline. With just normal treatment, it has a long life.

There are many other thermoplastics; the list has grown long in just a few years. But only a few others are used for insulations. Among them are Rulan, Nylon, Cardolite, Saran, Tenite II, Styraloy, and Teflon.

Polyethylene has a very high dielectric strength, low power factor and low moisture absorption when compared to vinyl resin. The latter has lower dielectric strength, high dielectric loss, and satisfactory moisture resistance.

Vinyl resin resists ozone. Polyethylene is immune to it. This indicates why polyethylene can be used for high-voltage and high-frequency circuits while vinyl resin, which is cheaper, does very well on low voltages. Both have a weakness. They become plastic at comparatively low temperatures. High overloads on these types of conductors must be guarded against. TABLE II lists some comparative values.

Kind of Insulation	Code Type	Application	Maximum Allowable Conductor Temperature and Location (degrees C)
vinyl resin	T	general purpose	60 dry locations
vinyl resin	—	general purpose	60 moist locations
vinyl resin	—	machine tool control and switchboard	60 in oil
vinyl resin	—	appliance wiring	80 in air
Polyethylene	—	general purpose	80,90, or 105 in air only*
Polyethylene	—	general purpose	80 usually special

*depending on compound used

TABLE II



"Thermoplastics
help me reduce."

Logically thermoplastics replace rubber insulations for some applications—but not for all. In building wire one outstanding property of thermoplastics is toughness. They require no protective braid. Hence, wire so insulated takes less space.

* * *

This article provides only a brief sketch of a fascinating field. Lower operating costs from more efficient power distribution influence plant profits. In the light of developments discussed here, many readers may want to re-evaluate their own wiring. It's a timely undertaking. We suggest that for more details you write to, or consult with, individual manufacturers.

DURASHEATH* neoprene-jacketed cable has ANACONDA Type ANW (cold-rubber) or Type AB (ozone and heat-resistant butyl) insulation, depending on voltage rating. Used for (1) distribution networks and where wet ducts may contain acid or alkali waters, (2) industrial power distribution overhead, in direct burial, or conduit, (3) circuits in conduit—and many other applications.

*Reg. U.S. Pat. Off.



If you want to cut equipment-relocation costs . . .

WIRE MACHINES TO MAKE THEM MOVABLE

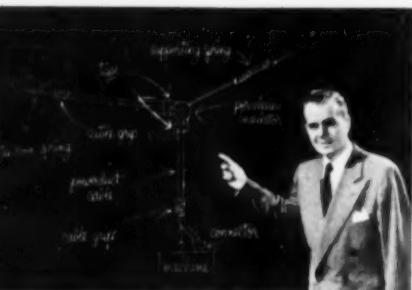
Basic industry strategy calls for more productive machine power. Look into plants like those of the automobile makers. There large banks of automatic machines are lined up in close array. They turn out parts. One bank may occupy only a small part of the long, huge floor area required.

MACHINES SOMETIMES MOVED

Each machine needs a cable. Offhand it seems easy to get cable to machine. But actually some ingenuity is needed to avoid excessive installation costs. The situation is aggravated by the chance that next year—or next month—all machines must be moved in accordance with model changes or plant efficiency.

BUS AND BUSDROP CABLE

You can solve the whole problem very neatly. First install a busduct system on ceiling or under roof trusses. Then connect each machine to it with a flexible cable carrying power and grounding conductors. This cable is called "busdrop cable."



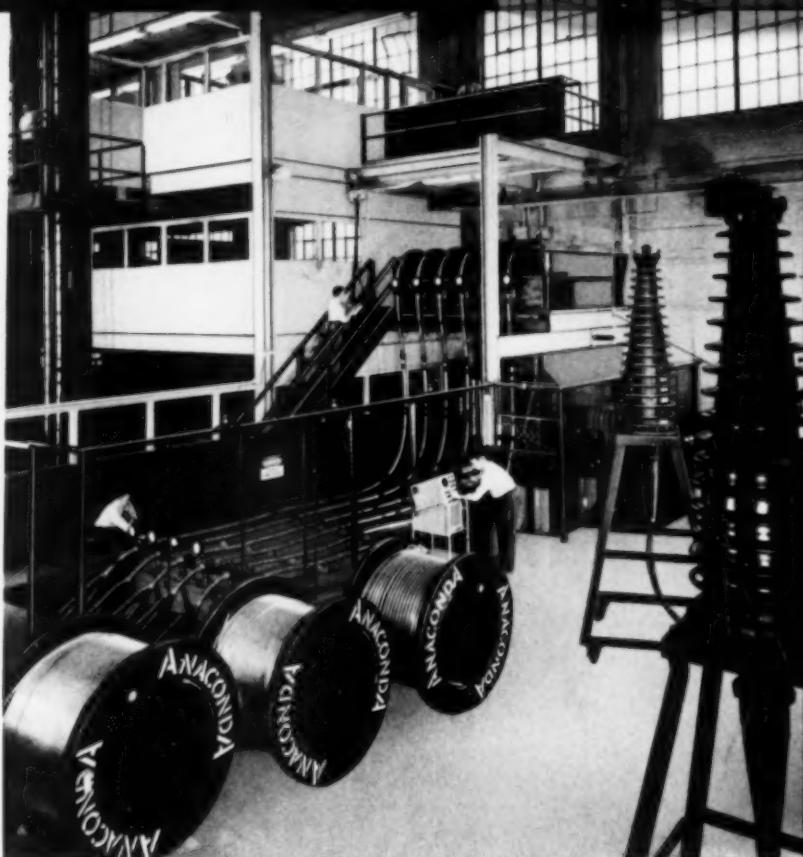
IT'S EASY to plug in your machine with flexible busdrop cable. There's no rigid conduit to rip out later.

TAILOR-MADE SYSTEM

Busduct Power Distribution Systems are widely used. They may be bought tailored to any plant's needs. They are economical; cable can be disconnected and reused elsewhere. This is done often. It means real flexibility, saves time and maintenance costs. It helps industry to keep up its high pace of production.

To do its job right, to last long and to stay neat, busdrop cable must be able to take heavy mechanical abuse and must handle easily. It must be impervious to oils, acids, water, greases, and cutting compounds. And, of course, it's always wise to look for approval from Underwriters' Laboratories, Inc.

52284



LAB THAT HURRIES TIME

... CUTS YEARS TO MONTHS IN TESTS
TO GIVE YOU LONGER-LASTING CABLES

In this Cyclic-Aging Laboratory at Hastings-on-Hudson, N. Y., high-voltage insulated cables race through the calendar. Once the valuable data which cable-aging made available to electrical engineers took decades to accumulate in actual service—often 20 to 50 years. But here a lifetime of experience is gained in a few years. Rigorous 24-hour test cycles simulate actual conditions . . . but are much more severe. Anaconda Engineers get

vital data on cable life, stability and other characteristics needed to evaluate cable design.

This is typical of Anaconda planning—geared to the future. It is only a part, however, of a company-wide program of expansion and improvement now nearing completion in mills and mines. Net result: better cables, available in larger quantities, that last longer and give you *true economy* in use when you specify ANACONDA.

FOR FURTHER INFORMATION about any product mentioned in the pages of this advertisement, see your Anaconda Representative . . . or write to *Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.*

ANACONDA®

TODAY'S HEADQUARTERS FOR WIRE AND CABLE

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HORTON

Elevated Tank



**piped for
Fire Protection
and
General Service
at Hatch Mill**

The 125,000-gal. Horton elevated tank shown at left was installed to provide the primary water supply for the Deering-Milliken Mill's Hatch Mill at Columbus, North Carolina. One-half of the capacity of the elevated tank is available for general service needs such as boiler water, dyeing, etc.—the other half is reserved at all times for fire protection. The automatic sprinkler system at the plant was installed by Daniel Construction Company.

Horton elevated tanks, piped for dual service, provide an economical solution to industrial water problems.

Field Welding Supervisor Plays Important Role

The reason Horton tanks always measure up to specifications is that we assign a Field Welding Supervisor to every welded structure we build. It is his job to check welding equipment and to make sure that every welder is qualified for the job. He assists with the cutting and grad-

ing of test plugs and helps conduct tests called for in the specifications . . . all at no extra cost to you!

Write our nearest office for estimates or quotations on a Horton elevated water tank to improve your water system.

*Trade Mark Registered in U. S. Patent Office.

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New York 6.....3312—165 Broadway Bldg.

Philadelphia 3.....1646—1700 Walnut St. Bldg.
Pittsburgh 19.....3272 Alcoa Bldg.
San Francisco 4.....1531—200 Bush St.
Seattle 1.....1140 Henry Bldg.
Tulsa 3.....1428 Hunt Bldg.

In Canada—HORTON STEEL WORKS, LIMITED, FORT ERIE, ONT.



HELPING the MAN-IN-THE-PLANT

ideas . . . tools . . . methods . . . devices

Chamfering Device Speeds Bucket Repair

THE deep fracture in this manganese steel bucket had to be bevelled or chamfered before welding could take place. When subjected to high heats, manganese steel passes through a metallurgical change in structure. Although the steel can be cut with a torch, it is believed that the area adjacent to the kerf may become damaged and the weld metal tend to crack because of the carbides in the area set up alongside the kerf.

The advent of ChamferTrode (Eutectic Welding Alloys Corporation) has meant the elimination of

many of these potential dangers. This chamfering device consists of a heavily coated electrode that may be used with a standard d-c machine of 300 amp. or more capacity. The coating is reduced more slowly than the core and forms a tube through which the arc force is concentrated and projected. The speed with which unwanted metal is blasted from the path of the electrode, combined with the concentration of energy into a fine tip, confines the heat to the groove. The chill is removed from the surrounding metal which is a desirable factor for subsequent welding. There is little heat affected area as is inevitable when conventional torch cutting methods are used.



The fracture in the manganese bucket had to be vee'd preparatory to welding. ChamferTrode was selected for the grooving operation because its speed minimized the formation of a heat affected area. It took exactly 1 minute to chamfer this fracture.



Welding Made Easier

WE had a pipe fitting job where it was necessary to weld a large number of pipe flanges to the ends of pieces of 4 and 6 in. diameter pipe prior to final assembly. The welder who did the job made a pair of iron saw-horse supported dollies (see illustration).

Ball type ring bearings procured from an automobile salvage yard were used for the dollies. The ends of the bearing shafts were welded across the edges of the flanges of a short piece of channel steel that was cut from the side member of a discarded automobile frame.

A saw-horse type of support was made by welding together pieces of

one inch diameter pipe, with feet made from square pieces of flat steel welded to the end of each leg.

The channel piece with dollies attached was welded to the central section of the short legged iron saw-horse.

The pipe to be rotated during the welding operation is placed in the saddle formed by the dollies. The piece to be welded to the end of the pipe (pipe flange, tee, reducer, etc.) is tack welded to the end of the pipe lying in the dollies. The welder then runs his bead or beads around the circumference, turning the pipe with only one hand as the bead progresses, thereby eliminating the need for a helper.—George Simon, Phillipsburg, Kansas.

The machine was set at 450 amp. d-c straight polarity. A 3/16-in. ChamferTrode was inserted into a conventional holder and held at a low angle to the work surface.

A characteristic of this electrode is its delayed action. After an arc has been struck the tube that is formed by the coating becomes partially electrically conductive through its impregnation with metallic particles from the arc. This permits the operator to align the electrode with his shield raised and thus obtain greater accuracy than would otherwise be possible. When a flicker of light is seen this is the signal the arc is about to start and it gives the operator time to lower his shield.

ChamferTrode is held practically horizontal to the line of travel to prevent digging into the base metal. It is actually pushed rapidly in the direction the groove is to take and the unwanted metal is literally blasted from its path leaving a bright, clean groove which requires no further cleaning and is an ideal base for welding.

SEND FOR THIS 32 PAGE

MULTICLONE BOOKLET

HELPFUL-INFORMATIVE IT OUT-LINES THEORIES AND BASIC PRINCIPLES OF CENTRIFUGAL DUST RECOVERY!

Or, for special side of pressure, the same Multiclone can even be outlet.

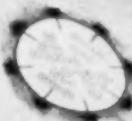


FIG. No. 15

Or, in still other shapes to fit specialized applications.

It is readily apparent that conventional cyclones, with their complicated manifolds and the separate inlet and outlet ducts required for each collector are far more restricted in their adaptability to space limitations.

A further space adaptability feature found in the Multiclone is the unusual flexibility of its inlet and outlet duct arrangements. Where headroom must be kept at a minimum, the Multiclone can be installed with side inlet and side outlet ducts, giving it an "in-line" installation that requires a minimum of vertical height.



FIG. No. 16

30

FIG. No. 17

Fig. No. 17 shows how the Multiclone's unique wave design, permits horizontal installation when this feature is required. This makes the most complicated units more adaptable to plant space requirements. Simple ducts are not practical when the inlet duct is usually at a higher level than the outlet, necessitating much more vertical clearance.



FIG. No. 18

32 PAGES OF DIAGRAMS AND INFORMATION

This booklet shows...

MULTICLONE'S SPACE SAVINGS...How the Multiclone requires less square footage, less cubic footage than most other equipment of comparable capacity and performance, thus saving costly plant space!

MULTICLONE'S ADAPTABILITY...How the Multiclone is more adaptable to varying inlet-outlet requirements—to varying space limitations—and is simpler to insulate, thus reducing installation costs!

MULTICLONE'S EFFICIENCY...How Multiclone's multiple small diameter tubes, made possible by its exclusive wave design, give higher centrifugal forces and more complete cleansing of all suspended particles—even small ones of 10 microns and less!

MULTICLONE'S LOW MAINTENANCE...How the Multiclone has no high speed moving parts to repair or replace, no pads or filters to clean or renew, nothing to choke gas flow or increase draft losses as suspended materials are recovered. Multiclone draft losses remain uniformly low—recovery efficiencies uniformly high—at all times!

Make sure that a copy of this helpful booklet is in your reference files by sending for your copy now!

NO MATTER whether you are now using mechanical dust recovery equipment or are planning the installation of such equipment at some future date, here is a booklet that is full of helpful and valuable information on centrifugal dust recovery. It not only explains the basic methods and principles involved, but also shows the important differences between small and large diameter separating tubes, shows how to simplify your duct work and reduce installation costs, and outlines many other important factors to be considered in selecting mechanical dust recovery equipment.

In addition, this informative booklet illustrates and explains how **MULTICLONE'S** unique *wave* design is fundamentally different...how it makes possible greater compactness, simpler installation, high recovery of the small particles as well as the medium and coarser ones, and many other facts on **MULTICLONE** advanced design.

A limited supply of these booklets is available for free distribution to those interested in mechanical recovery equipment and methods. Write for your copy today.

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Prevent leakage of water or steam or loss of vacuum

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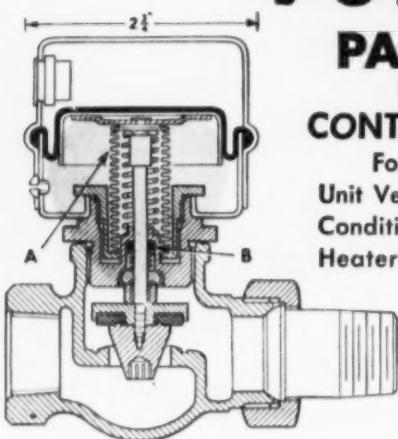
PACKLESS

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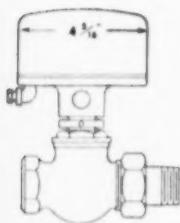
Unit Ventilators, Unit Air
Conditioners, Baseboard
Heaters, Radiators, etc.



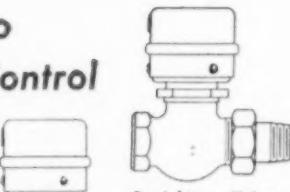
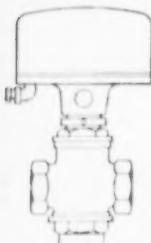
Various Types
and Sizes for
all requirements

Real ECONOMY

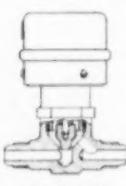
— year after year!



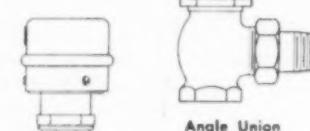
Straightway Union
3-Way Screwed Ends



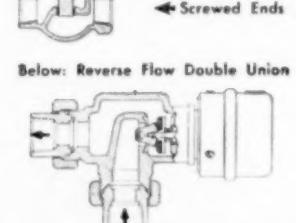
Straightway Union



Flared Ends



Angle Union
Screwed Ends



Below: Reverse Flow Double Union



Another POWERS Contribution to Better Heating and Air Conditioning Control

PACKLESS Valves with their many advantages are now standard with Powers temperature control systems. Their superior performance is due to duo-seal construction.

Bronze Packless Bellows (A) in sectional view above, is the primary seal which eliminates packing maintenance — packing friction — steam and water leakage or loss of vacuum. It is designed to withstand pressure up to 150 psi. Maximum valve stroke is only two-thirds of the normal bellows stroke.

A spring loaded secondary seal (B) permits servicing of valve top without draining the water system or shutting down the steam heating system. Seal is made of highly elastic neoprene and is ready to act at any time. Small contact between seal and the highly polished stainless steel stem makes friction a negligible factor.

For utmost dependability and lowest cost maintenance specify control by Powers **PACKLESS** Valves.

Compressors Keep Pressure Down

THE Mississippi Chemical Company, near Yazoo City, Miss., makes, among other things, liquid ammonia for agricultural use, the stock in the enterprise being owned by 10,000 Southern farmers. This is the first farmer-owned nitrogen fertilizer plant in the nation.

Special tractor-drawn implements for feeding the liquid ammonia to the soil have been developed. These comprise a pressure tank complete with control valves and safety valves, and distributing pipes running to the back of miniature plowshares. The ammonia is in a form which can be utilized rapidly by the growing plants, increasing the yield of the land to a remarkable extent.

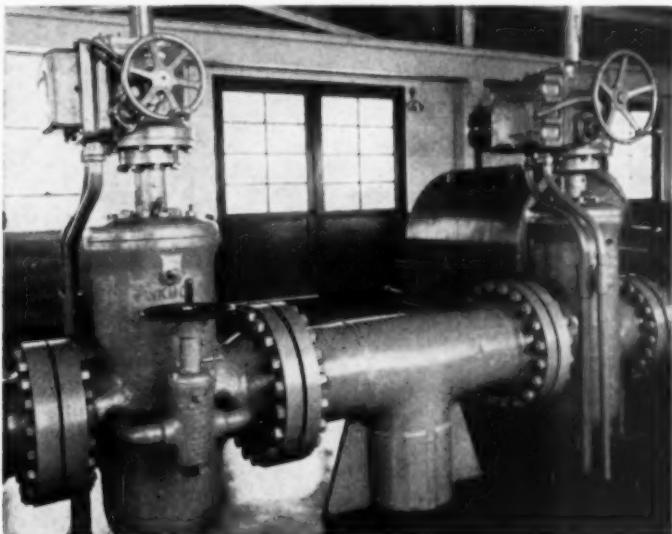
The liquid ammonia is stored in two Hortonspheres, each holding



1000 tons. In normal operation these receive two tons of liquid per hour.

To keep the pressure within these storage spheres at a reasonable figure, averaging 75 psi gauge, the ammonia gas formed at the top is constantly drawn off by means of three Frick 5 by 5 compressors. One of these is usually sufficient for handling the load. A reserve machine is

provided and a standby is arranged to be driven by a gasoline engine in case of power failure. The discharge gas is condensed in a shell-and-tube vessel cooled with water, and is returned as a liquid to the bottom of the spheres.



Reinforced Tee For Valve Support

WHERE heavy valves must be supported and provision made to snub any vibration before it can reach dangerous vol-

ume, it is often the practice to make the nearest pipe fitting serve also as support.

In one station, where two block

gates are set between successive pumps, the tee which serves as main when either pump is shut down, is reinforced with a heavy shroud of steel plate, formed to the pipe contour, and welded in place. Over this shroud and extending as far as the welding junction with the pipe nipples carrying one half of the companion flanges, paired angles of heavy plate are welded, extending downward through the floor to a flat plate. The latter is grouted into the concrete base of the pump room foundation.

With such a support the tee is maintained in place when a valve is removed for servicing, and accurate alignment assured for the set-up as the valve is replaced.

The heavy steel plate and triangular braces provide a dead point at which vibrations are snuffed out, preventing progressive build-up of stresses which otherwise might prove disastrous.

—Elton Sterrett, Houston, Texas.

NEWS for the South and Southwest

W. H. & L. D. Betz—Atlanta

W. H. & L. D. BETZ of Philadelphia, Pa., consultants on industrial water conditioning problems, have assigned J. W. WALLACE as district engineer for the ATLANTA-BIRMINGHAM territory. Mr. Wallace will make his headquarters at 4290 Twin Brooks Road, Brookhaven, Georgia.

Mr. Wallace recently completed two years of service as a lieutenant in the U. S. Navy. He is a graduate of Temple University (Philadelphia) and has had several years of experience with the Betz organization in engineering and field service capacities.

FUTURE EVENTS Of Engineering Interest

AMERICAN CHEMICAL SOCIETY, Alden H. Emery, Exec. Sec'y, 1155 16th St., Washington 6, D. C.
Sept. 6-11, Fall Meeting, Conrad Hilton Hotel, Chicago, Ill.

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS, Stephen L. Tyler, Exec. Sec'y, 120 East 41st St., New York 17, N. Y.
Sept. 13-16, Fairmont and Mark Hopkins Hotels, San Francisco, Calif.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, C. E. Davies, Sec'y, 29 West 39th St., New York, N. Y.
Sept. 21-25, Industrial Instruments and Regulators Division and Instrument Society of America Exhibit and Joint Conference, Sherman Hotel, Chicago, Ill.
Sept. 28-30, Petroleum Mechanical Engineering Conference, Rice Hotel, Houston, Texas.
Oct. 5-7, Fall Meeting, Hotel Sheraton, Rochester, N. Y.
Nov. 29-Dec. 4, Annual Meeting, Statler Hotel, New York, N. Y.

INSTRUMENT SOCIETY OF AMERICA, P. V. Jones, Mgr., 1319 Allegheny Ave., Pittsburgh 23, Pa.
Sept. 21-25, Eighth National Instrument Conference and Exhibit, Morrison Hotel, Chicago, Ill.

NATIONAL ASSOCIATION OF CORROSION ENGINEERS, A. B. Campbell, Exec. Sec'y, 1061 M&M Bldg., Houston 2, Texas.
Sept. 22-25, Corrosion Short Course, J. D. Lindsay, Chemical Engineering Dept., A & M College of Texas, College Station, Texas.
Oct. 7-9, South Central Region Meeting, Mayo Hotel, Tulsa, Okla.
Nov. 12, Southeast Region, Fall Meeting, Birmingham, Ala.

PETROLEUM ELECTRIC POWER ASSOCIATION, Fred B. Clark, Chm. Publicity Comm., Arkansas Power & Light Co., El Dorado, Ark.
Oct. 5-7, Silver Anniversary Meeting, Muehleback Hotel, Kansas City, Mo.

AMERICAN WELDING SOCIETY, J. G. McGrath, Exec. Sec'y, 29 West 39th St., New York 18, N. Y.
Oct. 19-21, Annual Meeting, Cleveland, Ohio.

AMERICAN SOCIETY FOR METALS, W. H. Eisenman, Sec'y, 7301 Euclid Ave., Cleveland 3, Ohio.
Oct. 19-23, Annual Meeting, Cleveland, Ohio.

Jones & Laughlin—Tenn.

JONES & LAUGHLIN STEEL CORPORATION, Gateway Center, Pittsburgh 30, Pa., has announced the opening of a warehouse in NASHVILLE, TENNESSEE. LOU R. WEBB is resident manager of the new warehouse, which was designed to expedite steel delivery to metalworking plants in central Tennessee.

Wheeling Corrugating Co. Names Cole—Houston, Tex.

E. R. COLE has been named manager of WHEELING CORRUGATING COMPANY's new HOUSTON, TEXAS, branch at 1100 East Holcombe Blvd.

Associated with Wheeling since 1937, Mr. Cole has been sales representative at the ATLANTA branch for the past several years.

Ager Becomes Georgia Manager G. E. Apparatus Sales

JOHN C. AGER of ATLANTA has been named manager of the Apparatus Sales Division of GENERAL ELECTRIC COMPANY for the State of Georgia with headquarters in Atlanta, it was recently announced by CARTER L. REDD, Southeastern District Manager.

In addition to the Atlanta sales office, the Georgia area is served by offices in Augusta, Macon, and Savannah. Managers of these offices are, respectively: W. E. WHITAKER, A. B. MORRISON, and P. B. SOWELL.

Mr. Ager, a native of Birmingham, Alabama, and a 1939 graduate of Duke University, where he received a degree in Electrical Engineering, joined General Electric in Schenectady in 1946 as a student engineer. He transferred to the Southeastern District in 1947 as sales engineer in the Atlanta Office, in which capacity he has served until his recent appointment as manager of apparatus sales for Georgia.



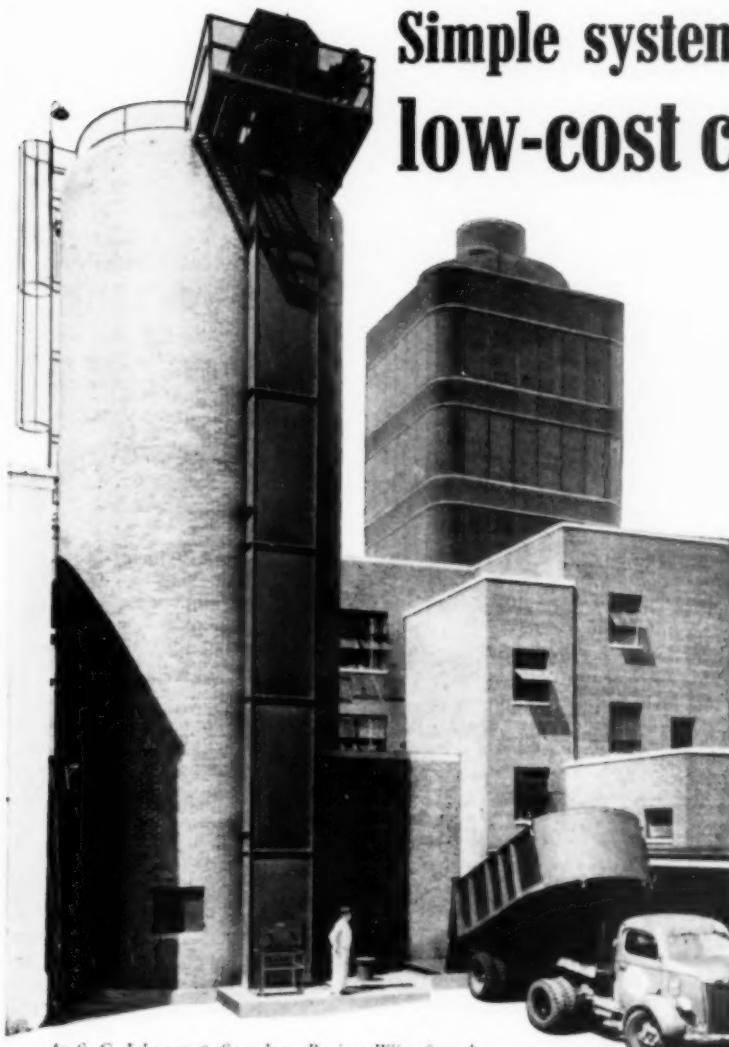
John C. Ager

Prior to joining G. E. in 1946 Mr. Ager served 5 years in the U. S. Navy in the European Theatre as a Lieutenant Commander. He also had one year of graduate work at Duke University prior to his entry in the Navy. He is a member of AIEE and is now serving as Secretary-Treasurer of the Georgia Chapter.



W. E. Whitaker is manager of General Electric Company's Augusta, Georgia, office; A. B. Morrison manager of the Macon office; and P. B. Sowell the Savannah office.

Simple system spells low-cost coal handling for small power plant



At S. C. Johnson & Son, Inc., Racine, Wis., famed laboratory forms background for power plant. Centrifugal discharge bucket elevator handles 40 tph.

LINK-BELT equipment at S. C. Johnson & Son, Inc. provides clean, efficient operation

THE compact, economical coal handling provided for the makers of Johnson's wax is typical of hundreds of Link-Belt power plant installations. Large or small—your plant, too, can get the added efficiency of modern, mechanized equipment.

Link-Belt's experience is based on years of success in meeting every type of coal handling problem. This vast background, combined with a complete line of coal handling equipment, is your assurance of a

system that's right for your needs. And Link-Belt's quality products have earned a reputation for dependable, long-life service. See your nearest Link-Belt office for a copy of Book 2410, showing many typical, modern power plant layouts.

LINK-BELT
COAL HANDLING EQUIPMENT

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle; Scarborough, Toronto and Elmira, Ont. (Canada); Springs (South Africa); Sydney (Australia). Sales Offices in Principal Cities.

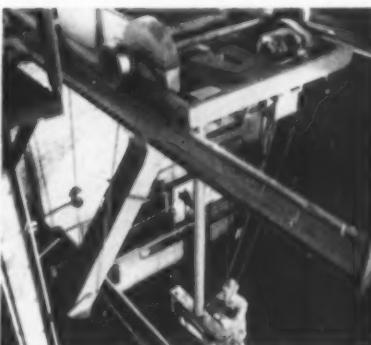
13-309



Apron conveyor loads bucket elevator.
Live or dead storage is fed by elevator.



From elevator, coal is moved by 12 in. screw conveyor atop storage silo.



Weigh larry delivers coal from discharge chute to three stoker hoppers.

news for the South and Southwest (continued)

General Electric Southeastern Appointments

C. L. REDD, Southeastern district manager of GENERAL ELECTRIC'S Apparatus Sales Division, recently announced the appointment of R. H. JACKSON of Atlanta to the newly created position of district sales manager. Mr. Jackson's district sales staff will be as follows: J. H. PERSONS, manager of agency and distributor sales; M. O. TROY, Jr., manager of apparatus product sales; B. D. CASEY, Jr., manager of component product sales; J. F. BAKER, manager of industry sales; J. L. TOWNSEND, manager of advertising and sales promotion and acting manager of marketing research; E. A. JONES, manager of order service.

All will be located at the district headquarters at 1860 Peachtree Road, N. W., Atlanta.

Mr. Jackson, a native of New Bern, N. C., and a 1925 graduate of the University of North Carolina where he received a degree in electrical engineering, joined G-E that year as a



R. H. Jackson

student engineer on the test course. After test he served in the company's control engineering and commercial sections, transferring to the Southeastern district in 1928 in the capacity of control specialist. In 1945 Mr. Jackson was appointed manager of the Industrial Division and in 1950 he also assumed the duties of manager of the Atlanta local office, serving in these positions until his present appointment as manager of sales for the Southeastern district.

Mr. Persons is a native of Talboton, Ga. He is a 1926 engineering graduate of Georgia Tech and joined G-E in Schenectady that year. Mr. Persons transferred to Atlanta in 1929, moving that same year to Columbia, S. C. as sales engineer. He returned to Atlanta in 1930 and later transferred to Charleston, S. C. In 1939 he transferred to Birmingham, until his enlistment in the Navy. He returned to G-E in 1945 as manager of the Greenville, S. C., office for a short time, returning to Atlanta as district motor specialist until his appointment as district manager of agency and distributor sales in 1950, the position he now holds.

Mr. Troy, a native of Schenectady, N. Y., and 1938 graduate of Lehigh University, joined G-E in 1939. After various test assignments he served in the turbine engineering and sales sections in Schenectady, transferring to the Southeast district in 1946 as turbine specialist, where he served until his recent appointment as manager of apparatus sales.

Mr. Casey was graduated from Alabama Polytechnic Institute in 1933 and joined the G-E test course in 1935. In 1936 he was assigned to the Central Station engineering group and in 1937 moved to Pittsfield. He transferred to the Southeastern district in 1940 as sales engineer in Nashville, with successive assignments in Chattanooga and Birmingham prior to his entry in the Navy. In 1946 he returned to G-E in New Orleans, serving utility accounts there until his recent appointment as manager component product sales.

Mr. J. F. Baker, a 1924 graduate of Virginia Polytechnic Institute, joined G-E that year in Schenectady. After various engineering assignments he transferred to the Southeastern district as a sales engineer in Birmingham. From 1942 to 1945 he served as Lt. Commander in the Navy. Returning to G-E in 1945 he was assigned to the Mobile, Ala., office as manager. In 1952 he came to Atlanta and served as assistant manager of the local office until his appointment as manager of industry sales.

Mr. J. L. Townsend is a native of Syracuse, N. Y., and was graduated from Syracuse University in 1925. He joined G-E's test course that same year, and was assigned to motor sales in 1926. During the succeeding years Mr. Townsend held various sales positions. He joined the Southeastern district apparatus sales group in 1949, serving in Florida until his appointment as manager of advertising



J. H. Persons



M. O. Troy, Jr.



B. D. Casey, Jr.



J. F. Baker



J. L. Townsend



E. A. Jones



FLUORESCENT LAMPS need constant voltage for maximum operating efficiency and lamp life.

Manual and Automatic Inductrols in sizes (left) 6 to 9.6 kva and (right) 12 to 24 kva.



Maximum equipment life—less operating cost with G-E voltage regulators

You can eliminate the harmful effects of undervoltage and overvoltage on your a-c electric equipment by installing G-E Inductrols. These dry-type regulators automatically maintain correct voltage and insure peak operating efficiency.

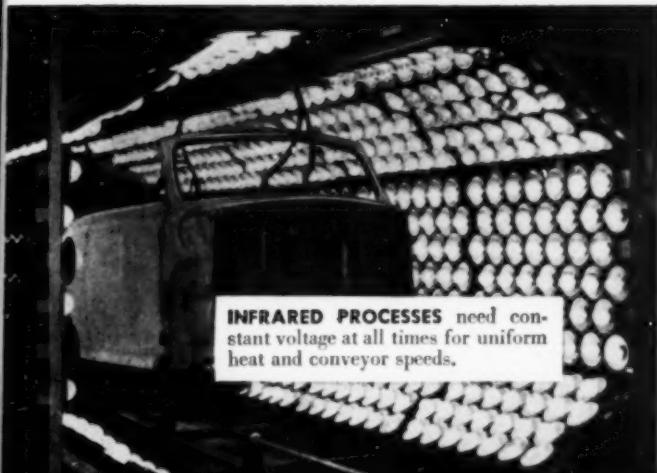
Standard automatic regulators are available for circuits from 3 kva, 120 volts up to 520 kva, 600 volts either single- or three-phase. For more information, contact your nearest G-E Sales Representative, or write for Bulletins GEA-5824, GEC-795 and GET-2351. General Electric Company, Section 423-202, Schenectady 5, New York.

You can put your confidence in—

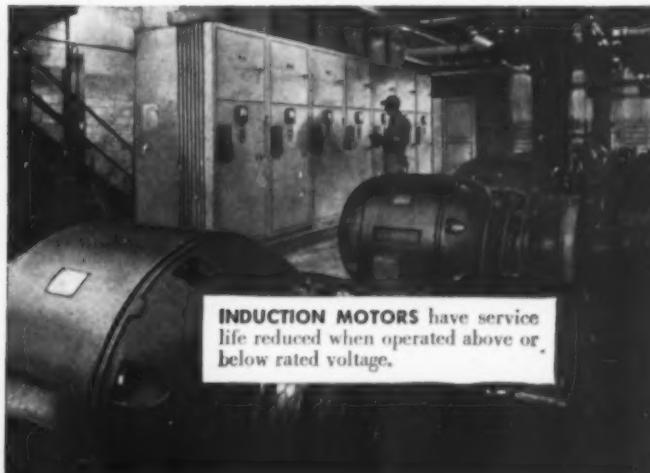
GENERAL ELECTRIC

WHY YOU NEED GOOD VOLTAGE

EQUIPMENT	10% UNDERVOLTAGE	10% OVERVOLTAGE
INCANDESCENT LAMP BULBS	Cuts light output 30% —slows production	Cuts life 70% —triples costs
A-C MOTORS	Overheat—ups maintenance costs	Lowers power factor—ups power costs
RESISTANCE HEATERS	Cuts heat output 19% —slows production	Overheats—ups replacement costs
ELECTRONIC DEVICES	Probably destroy gas-filled tubes	Only 5% over cuts tube life 50%
INFRARED PROCESSES	Ups process time—slows production	Blisters, scorches—ups production cost



INFRARED PROCESSES need constant voltage at all times for uniform heat and conveyor speeds.



INDUCTION MOTORS have service life reduced when operated above or below rated voltage.

news for the South and Southwest (continued)

and sales promotion in November, 1952. Under the new organization he will also take over the duties of the marketing research.

Mr. E. A. Jones joined G-E in Schenectady in 1923. A native of Shelby, N. C., he is a 1923 graduate of North Carolina State. In 1925 he transferred to the Southeastern district and in 1946 was named manager of the order department, which has now been made a division of Mr. R. H. Jackson's management staff organization.

Hobart Brothers—Tulsa

Newest HOBART WELDER SALES & SERVICE branch office and warehouse is at 1535 South Yale St., TULSA, OKLAHOMA. A modern show room displays the complete line of arc welders, electrodes, and accessories. Ample stocks are carried in the large warehouse to assure quick delivery. CLYDE P. WHITMIRE, Hobart Distributor in Tulsa for the past four years, is manager of the new branch.

Gisholt Machine Co., Texas

GISHOLT MACHINE COMPANY, 1245 E. Washington Ave., Madison, Wisconsin, has appointed NICK S. DEANOVICH as its Texas representative, with headquarters at 4101 San Jacinto St., HOUSTON, TEXAS.

Mr. Deanovich has been with the company for nearly fifteen years. After six years as a machine operator, foreman, and supervisor, he went into sales and service, traveling over a wide territory.

Southern Railway Freight Yard—Chattanooga, Tenn.

THE SOUTHERN RAILWAY SYSTEM will build a new freight yard at CHATTANOOGA, TENN., to cost approximately \$14 million.

The new facility will have complete facilities for receiving, classifying and forwarding trains. It will incorporate the best features of the new Knoxville and Birmingham yards and also include the innovations that have been devised since they were put in service.

The present Chattanooga Yard will be integrated into the new and larger one when the latter is completed, but construction work on the new yard will not interfere with the handling of traffic through the present yard.

Engineer in charge of construction, with headquarters at Chattanooga, will be E. H. COOK, formerly assis-

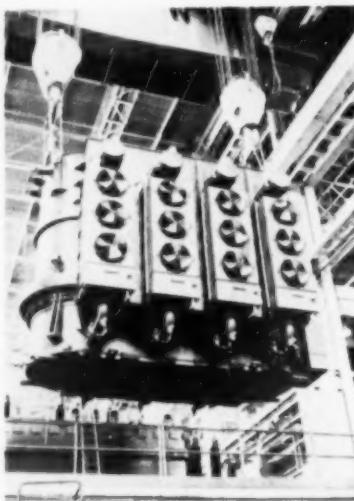
tant division engineer of the railway's Knoxville Division, and who participated in the construction of the railway's yards at Birmingham and Knoxville.

Giant Transformers Shipped to AP&L

Two giant power transformers, each rated 175,000 kva, highest capacity units built to date by the GENERAL ELECTRIC COMPANY, have been shipped to the fast growing ARKANSAS POWER & LIGHT COMPANY.

The transformers are 70,000 lb lighter than similar units of less than half the capacity shipped about three years ago to the same power company, G-E engineers stated. Dimensions of the new units (approximately 20 x 22 x 15 ft) are also less than the earlier units (approximately 24 x 25 x 16 ft). Floor space above is about 17% less. Recent developments in cooling and insulation have made possible the reductions, according to company engineers.

Because of their compactness, the transformers will be shipped upright in their own complete tanks. Only installation work required is skidding the units off the rail cars onto their foundations and assembling the bushings and unit coolers.



Transformers are of the forced-oil, air-cooled type, utilizing seven oil-to-air heat exchangers. Each of the units, weighing 287,000 lb, will contain 5,880 gallons of oil weighing 44,000 lb. Nearly 22 tons of copper were used to make the windings of each transformer. They are scheduled for installation at the Harvey Couch Station, Stamps, Ark., and at the Cecil Lynch Station, near Little Rock, Ark., and will transform generator voltage of 17,500 volts to 115,500 volts.

Georgia Power Company Engineering Promotions

Three promotions in the engineering department of the GEORGIA POWER COMPANY have been announced by W. P. HAMMOND, vice president in charge of engineering. R. N. BENJAMIN, mechanical engineer for the company, was named chief engineer; E. S. HARRISON, hydraulic engineer, was appointed assistant chief engineer, mechanical division; and E. J. ARCHBOLD, electrical engineer, was named assistant chief engineer, electrical division.



R. N. Benjamin

Mr. Benjamin, a native of Greenwood County, S. C., is a graduate of Clemson College. Prior to coming to the Georgia Power Company as a draftsman in 1919, he served with the U. S. Army Corps of Engineers. He is a member of the American Society of Mechanical Engineers, Society of American Military Engineers and Georgia Engineering Society.

Mr. Harrison is a native of Benton, Tenn., and a graduate of the Georgia Institute of Technology. Before coming with the Georgia Power Company in 1939, he was a civil engineer with the Tennessee Electric Power Company. He is a member of the American Society of Civil Engineers and the American Geophysical Union.

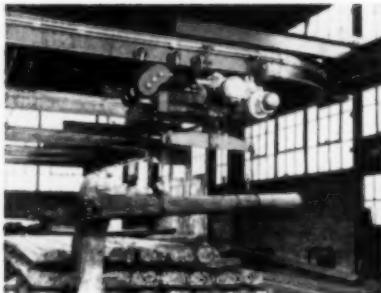
Mr. Archbold is a native of Decatur, Ind., and a graduate of Purdue University. Prior to coming with the Georgia Power Company in 1927, Mr. Archbold was with the General Electric Company, Schenectady, N. Y., and the Aluminum Company of America, Badin, N. C. Mr. Archbold is a member of the American Institute of Electrical Engineers.

Rockwell—Tupelo, Miss.

DEAN WEIKART, former tool and product engineer with ROCKWELL MANUFACTURING COMPANY'S Crescent Machine Division at Leetonia, Ohio, has been promoted to chief engineer of the firm's TUPELO, MISS., plant.

MONORAIL Pays!

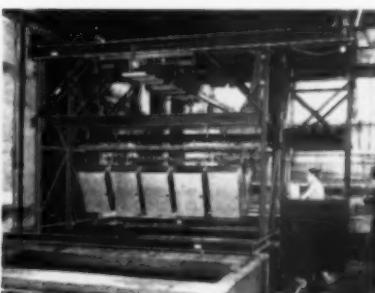
INCREASES TONNAGE



From 26 to 48 tons of steel rod per day was the increased movement produced by a properly engineered monorail system.

LOWERS COST

This simple system actually saved \$150 in handling costs within four months of operation. No more sheet-by-sheet movement.



SAVES TIME

Passage, on monorail, of metal parts through infra-red dryer, cuts 70% from former drying time. All other handling in plant on monorail.

MORE CAPACITY

30% more capacity was added to metal cleaning process by handling a third more units on carrier with one man operation from cab control.

LESS LABOR

Operators claim to save 26 man hours per truck over former unloading time. Interlocking monorail cranes in the plant also reduce handling costs.



Write for Bulletin C-1
showing many more cases
where MONORAIL PAYS!

THE AMERICAN

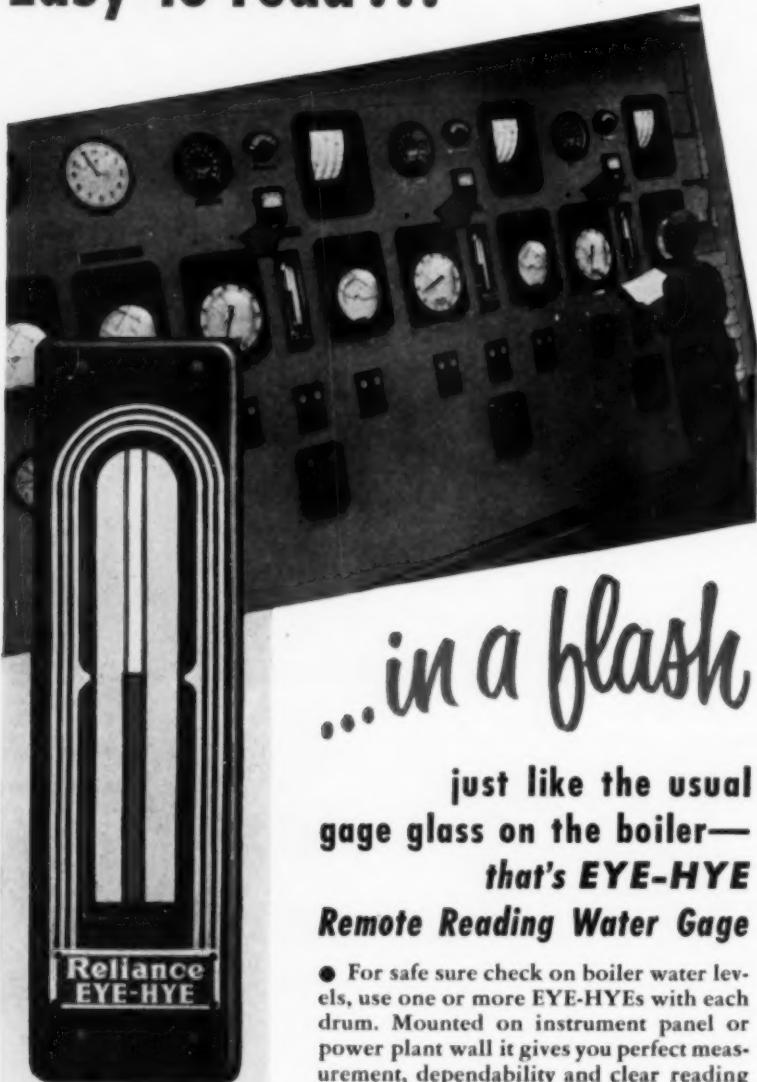
MONORAIL

COMPANY

13105 ATHENS AVENUE

CLEVELAND 7, OHIO

Easy to read...



...in a flash
just like the usual
gage glass on the boiler—
that's **EYE-HYE**
Remote Reading Water Gage

For safe sure check on boiler water levels, use one or more EYE-HYES with each drum. Mounted on instrument panel or power plant wall it gives you perfect measurement, dependability and clear reading . . . clear reading in simplest form, like the usual gage glass . . . clear reading in a column of brightly illuminated green fluid. All-hydrostatic principle—no mechanical parts—no adjustments on location—practically no maintenance. EYE-HYE is made for any working pressure—any visibility length. Write for Bulletin CO.

**THE RELIANCE GAUGE COLUMN CO.
5902 Carnegie Ave., Cleveland 3, Ohio**

Now two EYE-HYE
Remote Gages give
you the required
double check on
pressures 900 lbs.
and over, accord-
ing to Code inter-
pretation Case No.
1155.

The name that introduced safety water columns....in 1884

Reliance®
BOILER SAFETY DEVICES

news (continued)

Patterson—Atlanta

THE PATTERSON FOUNDRY & MACHINE Co., East Liverpool, Ohio, has established a district sales office at 311 Georgia Savings Bank Bldg., Atlanta, Georgia, with IVAN W. BENSON as District Sales Manager. The office will serve customers throughout the South and particularly in Georgia and Alabama.



Ivan W. Benson

Mr. Benson is a Mechanical Engineer with many years of sales engineering experience and a wide knowledge of the chemical and processing industries.

New Lincoln Division

Straight line mass production techniques and economies are now being applied by THE LINCOLN ELECTRIC COMPANY of Cleveland, Ohio, to the reconditioning and rebuilding of arc welding equipment in its new \$10,000,000 plant. The new Line-conditioning Division, under the supervision of Robert Dalzell, will rebuild for users of Lincoln equipment their engine driven motor generator and a-c welders.

New techniques for rebuilding electrical equipment, gasoline and diesel engines have been developed and worked into conveyor line procedures. All parts of engines, motors, generators are completely disassembled, cleaned, stripped, checked for condition, rebuilt, reassembled and given standard factory final tests. Electrical parts that need rewinding are put through the company's regular production lines. Gasoline and diesel engines are rebuilt by standard factory methods by men trained in manufacturers' plants. The reassembled welder is given final tests and painting that meet factory inspection standards.

Allis-Chalmers—Ala., Ga.

B. H. MCCOIN, ELECTRICAL EQUIPMENT, 1003 Scenic Drive, KNOXVILLE, TENN., has been named a distributor for ALLIS-CHALMERS transformers in portions of ALABAMA and GEORGIA. The firm was established in 1945 and is headed by B. H. McCoin.

THE ALABAMA ELECTRIC CO., 215 East Troy St., DOTHAN, ALA., has been named a distributor for Allis-Chalmers motors, controls and Tex-rope drive equipment in Barbour, Henry, Dale, Coffee, Houston, Geneva, Covington, and Escambia counties in Alabama.

Partners in the concern, which was established in May, 1953, are C. E. Sloop, Jr., president; B. H. Daniel, financial officer, and J. E. Whitehurst, sales manager.

G-E Atlantic District

The following appointments in the Atlantic District of GENERAL ELECTRIC'S APPARATUS SALES DIVISION were announced recently by F. C. Ruling, district manager; N. L. Whitecotton, manager of sales; R. M. Bleak, manager of marketing research; E. G. S. Maxwell, manager of apparatus product sales; C. L. Davison, manager of industry sales; and H. W. Robinson, manager of agency and distributor sales.

C. R. Stouch was named to Mr. Maxwell's former position as manager of the Charleston, W. Va., office, and E. A. Rohana was appointed auditor of the Baltimore office.

The G-E Atlantic District, with headquarters at Philadelphia, encompasses all of the states of DELAWARE, MARYLAND, and WEST VIRGINIA, major portions of Pennsylvania and VIRGINIA, and parts of New Jersey, Ohio, and NORTH CAROLINA.

Fine Organics—Alabama

FINE ORGANICS, INC., 211 E. 19th St., New York 3, N. Y., announces the appointment of JOSEPH G. PUTMAN, 3124 Lexington Road, MONTGOMERY, ALABAMA, as its exclusive selling agent for its Aviation-Industrial line, in the States of Alabama, Georgia and its industrial line in North Florida.

This company has technical personnel to assist customers in the solution of their chemical cleaning problems. Fine Organics, Inc., will make available through Putman Company, its "Strato Line" of aviation maintenance chemicals and "F. O." line of industrial maintenance chemicals.



RUST-OLEUM®

STOPS RUST!

Resists Rain, Snow,
Heat, Fumes,
Weathering,
Salt Water, etc.



Rust-Oleum saves preparation, saves manhours! Just scrape and wirebrush to remove rust scale and loose particles . . . then brush Rust-Oleum 769 Damp-Proof Red Primer directly over the sound rusted surface. Rust-Oleum finish coatings in many colors, aluminum, and white provide double protection. Specify Rust-Oleum for new construction, maintenance, or re-modeling. Prompt delivery from Industrial Distributor stocks in principal cities.

ATTACH TO YOUR LETTERHEAD — MAIL TODAY!
RUST-OLEUM CORPORATION
2722 Oakton St., Evanston, Illinois

- Have a Qualified Representative Call
- Free Survey
- Complete Literature
- Nearest Source of Supply



news for the South and Southwest (continued)

Textron Plant—S. C.

The multi-million dollar throwing and tricot plant being built at WILLIAMSTOWN, SOUTH CAROLINA, for TEXTRON, by DANIEL CONSTRUCTION COMPANY of Greenville, South Carolina, and Birmingham, Alabama, is nearing completion according to a recent announcement.

This project, providing a complete new plant near the synthetic weaving plant at Williamstown, is one of several plants that Textron has added to its manufacturing chain during the past two years.

Worthington Corp.—Alabama

WORTHINGTON CORPORATION'S plans for the construction of a new plant in DECATUR, ALABAMA, were announced recently. The plant site is a 100-acre tract of land bordering the Tennessee River.

It is estimated that the initial plant and equipment will represent an investment of approximately \$3,500,000 and will employ up to 400 persons. Worthington contemplates occupancy by November. A building approximately 240 ft wide and 600 ft long is being erected for the manufacture of

the company's line of self-contained air conditioning units as well as related products. The building will be completely air conditioned. An office building containing 10,000 sq ft of floor space will also be provided.

Erection of docking facilities on the Tennessee River will provide the plant with direct inland water transportation, allowing materials to be shipped in and finished products to be shipped out by this means. Railroad siding facilities are also available to the plant.

A-C Names Hinich—Dallas

ROBERT E. HINICH has been assigned to the DALLAS, TEXAS, district office of ALLIS-CHALMERS general machinery division as a specialist in water conditioning sales and service.

For the past three years, Hinich has been engaged in sales application and service work for the water conditioning section with headquarters at Allis-Chalmers West Allis Works.



Southern Engine & Pump Company branches at Edinburg (upper left), San Antonio (upper right), Dallas (lower left), and Kilgore (lower right), Texas, and Houma, Louisiana (not shown) are offering Nordberg 4FS Diesel engines and service under terms of distributor agreement announced by Nordberg Manufacturing Company.

Southern Engine & Pump Nordberg Distributor

Appointment of SOUTHERN ENGINE & PUMP COMPANY, 900 Saint Charles St., HOUSTON, TEXAS, as distributor for Nordberg 4FS Diesel engines in 117 Texas counties and Southern Louisiana is announced by NORDBERG MANUFACTURING COMPANY, Milwaukee, Wisconsin.

The engines will be sold and serviced through Southern Engine & Pump Company branches and through offices at Lafayette and New Orleans, Louisiana. Nordberg 4FS Diesel engines are added to their present lines which include Le Roi engines, and Pomona, Goulds and Viking pumps.

Southern Engine & Pump Company

was organized in 1908 with one office and a crew of four. This organization has grown until it now has branches in six Texas and Louisiana cities and executive offices and manufacturing facilities at Houston. The company has purchased property in New Orleans and plans to supplement sales representation by building another branch office with warehouse and shops in that city.

Founder of this organization was C. A. Leavens, who is still active in the business as its Chairman. D. N. Wommach is President, and W. G. Price is Vice President in charge of sales. S. R. Carrington, Secretary, is in charge of sales in the State of Louisiana. Richard Kropp is Vice President and Chief Engineer.

Wall Colmonoy—Birmingham

Appointment of H. J. YARBROUGH as manager of the BIRMINGHAM, ALABAMA, branch of WALL COLMONOY CORPORATION has been announced by the Detroit firm which manufactures corrosion, wear, abrasion and impact resistant alloys. The Birmingham branch is located at 615 North 9th Street.

Yarbrough, a native of Birmingham, is well known in industrial sales work in the South. During six of his 11 years with National Cylinder Gas Company he was a branch sales manager. Prior to his appointment by Wall Colmonoy he was in charge of industrial sales for a Birmingham welding supply house.



make it a
**One-Piece
Pipeline**

with WALSEAL®

...and you can *see* that it's made right. When you make a WALSEAL joint the fillet of silver brazing alloy that appears at the face of the fitting is your assurance of full penetration and a permanently leak-proof joint that's vibration proof and corrosion-resistant . . . won't creep or pull apart under any conditions that the pipe itself can withstand.

Walseal is a registered trade-mark which identifies valves, flanges and

fittings manufactured by the Walworth Company. Walseal products have *factory-inserted* rings of silver brazing alloy in threadless ports. Joints made with Walseal products are silver brazed and actually make the system a "one-piece pipeline."

Your copy of Circular 115 giving details on Walseal valves and fittings will be sent on request . . . send for it or see your nearby Walworth distributor.



Make it a "one-piece pipeline"
with Walseal



WALWORTH
valves and fittings

60 EAST 48nd STREET

NEW YORK 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

SOUTHERN POWER & INDUSTRY for SEPTEMBER, 1953

ELECTRO DYNAMIC
extra dependable



OFFICIAL U. S. NAVY PHOTO TAKEN OFF OAHU, HAWAII

UP FROM THE SEA comes fabulous Motor Stamina for Industry!

Over half a century of service aboard U.S. Navy submarines — where dependability means life itself — has bred tremendous stamina into ELECTRO DYNAMIC industrial motors. This inheritance of extra dependability, proved during years of grueling duty under the sea, explains the amazing performance records being established by E.D. motors in industry today.

From 1 to 250 h.p.

(N. E. M. A. STANDARDS)



WRITE TODAY FOR
CATALOGUE
NO. 972



One-piece
cast iron
frames.

Extra large
"free-flo" air
channels.

Permanently
aligned cast
iron brackets.

Liberal size
grease lubri-
cated bearings.

Also a complete line of Direct Current motors and generators

ELECTRO DYNAMIC
DIVISION OF GENERAL DYNAMICS CORPORATION
BAYONNE, NEW JERSEY

news (continued)

Insul-Mastic—N. C.

INSUL-MASTIC CORPORATION OF AMERICA, 1141 Oliver Bldg., Pittsburgh 22, Pa., announces that THE STARR DAVIS COMPANY, INC., GREENSBORO, NORTH CAROLINA, is a new licensee to act as applicator and distributor of the company's heavy mastic coatings for the vapor-sealing of insulation, for waterproofing masonry, and for corrosion prevention.

Sterling—Mo., Kans., Tex.

STERLING ELECTRIC MOTORS, INC., has announced the appointment of the following additional distributors for Sterling Electric Power Drives: INDUSTRIAL EQUIPMENT COMPANY, 303 Wall Street, JOPLIN, MISSOURI; WEDELL ELECTRIC SUPPLY CO., 1209 Williams St., GREAT BEND, KANSAS; ELECTRIC FIXTURE & SUPPLY CO., 1211 So. Santa Fe, SALINA, KANSAS; and POWER SUPPLY, 305 E. Austin, MARSHALL, TEXAS.

Amercoat Corp.—Houston

AMEROCAUT CORPORATION, manufacturer of protective coatings for industrial and marine application, has relocated its branch offices and warehouse in new and larger quarters at HOUSTON, TEXAS.

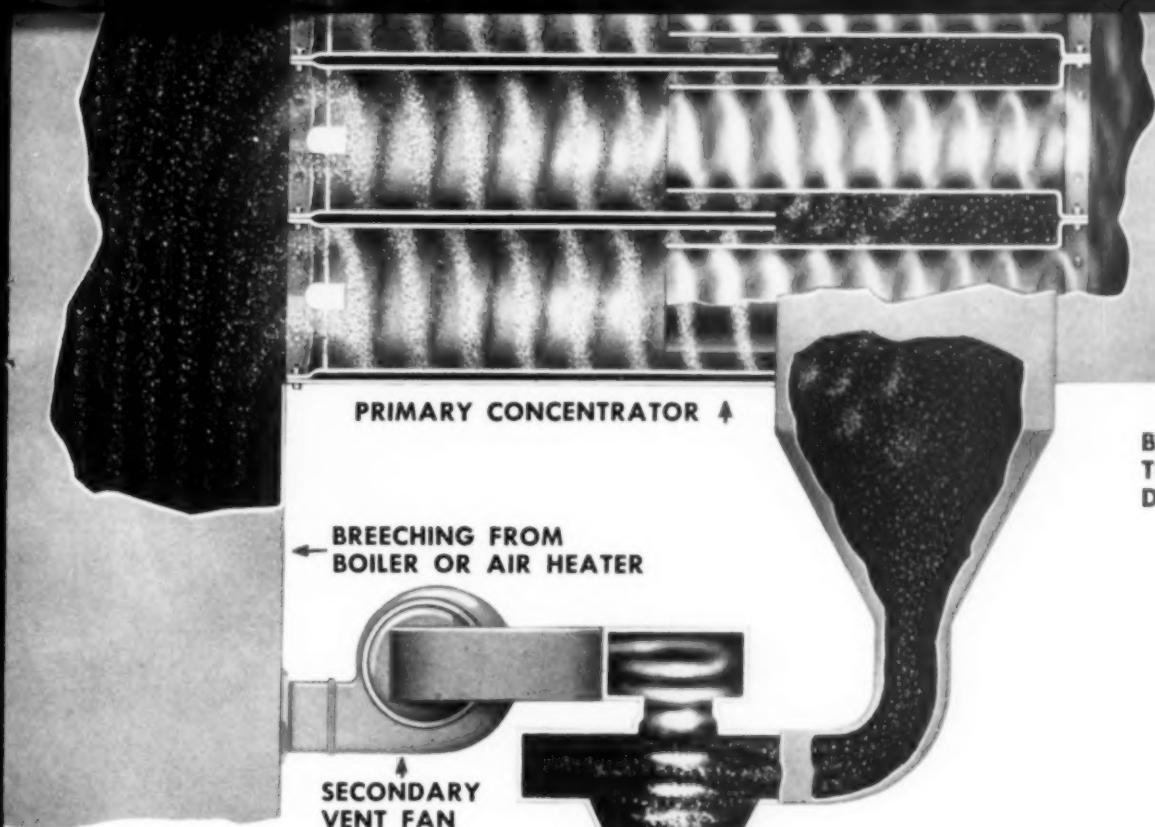
The new branch offices are at 6530 Supply Row in Houston's expanding Supply Row Center industrial area where many other national firms have recently established facilities to better serve the growing Southern industrial market.

LUCIEN L. MINER, Amercoat District Manager, is in charge of operations at the new location. Amercoat formerly maintained its south central branch at Dallas.

Detroit Diesel—La., Okla.

THE DETROIT DIESEL ENGINE DIVISION OF GENERAL MOTORS has announced that A. W. ANDERSON, formerly factory sales representative to Detroit Diesel distributors in the NEW ORLEANS sales zone has been transferred to the Los Angeles area. He is succeeded by RALPH PONTIUS, former factory service representative in the New Orleans territory. STANLEY PILLSBURY has been assigned to the post vacated by Mr. Pontius.

Other reassessments include the transfer of CHARLES HOWELL, former Los Angeles area sales representative, to the TULSA sales office. He will serve as assistant to A. F. CAMPBELL, manager of engine sales to the Petroleum industry.



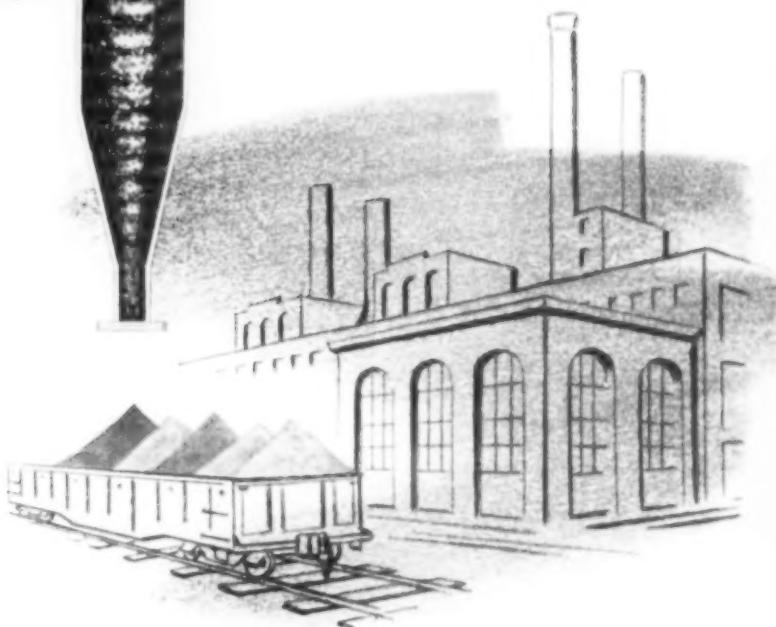
SECONDARY SEPARATOR DISCHARGES THE
FLY ASH TO AN AIR TIGHT RECEPTACLE OR
SEALED ASH DISPOSAL SYSTEM

Simplest way to solve your fly-ash problem

Install a Type ST Fly Ash Precipitator like that shown above.

On a given application, as the load falls off and fly ash becomes more difficult to catch, the ST Precipitator automatically maintains higher efficiency than any other collector of mechanical type.

Contact the nearest of many American Blower and Canadian Sirocco Branch Offices, strategically located throughout the United States and Canada, for complete information on Type ST Fly Ash Precipitators.



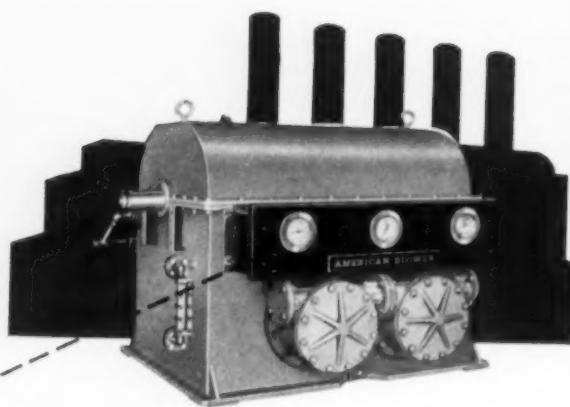
AMERICAN BLOWER

AMERICAN BLOWER CORPORATION, DETROIT 32, MICHIGAN
CANADIAN SIROCCO COMPANY, LTD., WINDSOR, ONTARIO

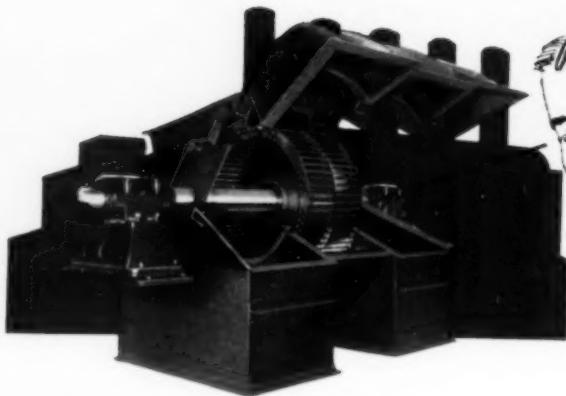
Division of AMERICAN RADIATOR & Standard Sanitary CORPORATION

Serving home and industry
AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS & WALL TILE • DETROIT CONTROLS • KEWANEE BOILERS • ROSS HEATER

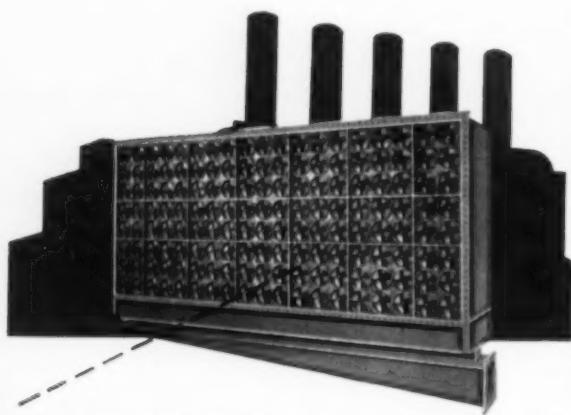
It all depends on how you look at it



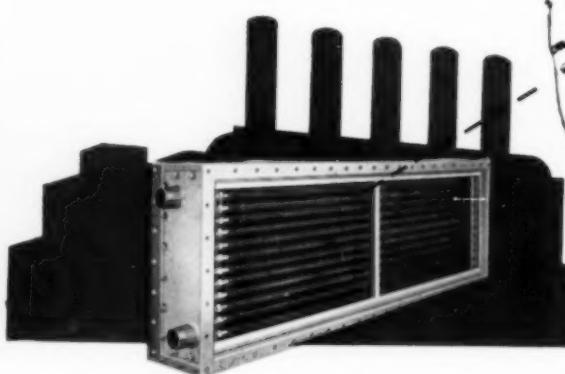
TO A CONTROL MAN this American Blower Class 6 Gyrol Fluid Drive, for flexible control of boiler feed pumps, looms up as big as this in relation to a power plant. He sees, too, American Blower Class 4 Fluid Drive for fan control.



TO A MECHANICAL DRAFT MAN a Sirocco Multi-Blade Fan, which delivers more gas per revolution than any other type, takes *this* proportion in the picture. He could see an American Blower HS Fan equally large if thinking of forced draft.



TO A FLY ASH EXPERT an American Blower Type ST Fly Ash Precipitator looks like this in relation to the rest of the power plant. Little wonder, for the Precipitator lifts a load off his shoulders and minimizes a nuisance.



TO A COIL MAN American Blower Heavy Duty Steam Coils would appear like this in his power plant picture. He likes their great strength, easy accessibility and the way they withstand the high pressures of heavy loads.

Looking at your complete power plant picture, we believe you'll find, as hundreds of others have, that all these American Blower Products improve over-all power-plant efficiency and insure years of dependable operation. Call our nearest Branch Office for complete data.

AMERICAN  **BLOWER**

AMERICAN BLOWER CORPORATION, DETROIT 32, MICHIGAN
CANADIAN SIROCCO COMPANY, LTD., WINDSOR, ONTARIO

Division of AMERICAN RADIATOR & Standard Sanitary CORPORATION

Serving home and industry

AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS & WALL TILE • DETROIT CONTROLS • KEWANEE BOILERS • ROSS HEATER



The first line of reducers
is still the foremost line



T F



Old timers will recall the day—more than 20 years ago—when Taylor Forge announced the first comprehensive line of butt-welding fittings.

Before the WeldELL line was introduced, the only available welding fittings were elbows. But in the WeldELL line came all the fittings needed to do a complete and workmanlike job of pipe welding . . . the tees, reducers, caps, stub ends, and welding flanges.

To produce all of these types of fittings in seamless forged steel was a giant undertaking—and still is. A good example of this is the line of reducers. Today there are 175 reductions in standard weight reducers alone—and this can be multiplied by all the weights and materials in which Taylor Forge reducers are available.

The first line is still the foremost line—the engineered line, the full value line. For up-to-the-minute facts about the WeldELL line, see your Taylor Forge Distributor.

TAYLOR FORGE

TAYLOR FORGE & PIPE WORKS

General Offices & Works • Chicago 90 • P. O. Box 485
Plants at: Carnegie, Pa., Fontana, Calif., Gary, Ind., Hamilton, Ont., Canada



Not just better refractory products —BETTER SERVICE, too!

The hundreds who *always* come to Plibrico for *all* refractory needs have a very solid reason for doing just that: They have found that the name, Plibrico, stands for a combination of products, methods, and services that never fail to deliver better end results at lower cost.

In Plibrico they find, not just one, but all the answers to their needs:

THE RIGHT PRODUCTS: Plibrico Jointless Firebrick in grades for every firebox application; Plicast castable refractory in grades for every use beyond the firebox.

ENGINEERING KNOWLEDGE accumulated in dealing with every conceivable furnace design and boiler setting problem.

CONSTRUCTION METHODS that put a better product into still better practice: Plibrico Flexo-Anchors that prevent bulging; Taperlok supports that provide sectionalized construction — air cooling when required.

All this is available in *every* industrial trading center through the nation-wide Plibrico sales and service set-up. Your nearby Plibrico Sales & Service organization is ready to show you the unapproached combination of products, engineering, construction, and installation that *IS* Plibrico!

Ask for our 48 page catalog

Plibrico Company

1838 Kingsbury St., Chicago 14, Ill.

PLIBRICO SALES & SERVICE IN PRINCIPAL CITIES
REFRACTORY PRODUCTS • ENGINEERING • CONSTRUCTION

news (continued)

Hammel-Dahl—Memphis

THE HAMMEL-DAHL COMPANY of Providence, R. I., manufacturers of automatic control equipment, announce the appointment of C. W. DEAN AND ASSOCIATES, 1509 Madison Avenue, MEMPHIS 4, TENNESSEE, as additional sales and service representatives.

This newly formed organization will offer the complete sales and service facilities of Hammel-Dahl engineering and products. This will enable Dean to offer a complete service on control valves.

Mr. Charles W. Dean organized his company in 1949. After graduating from the University of Tennessee in 1940, he was employed by the Buckeye Cotton Oil Company and, later, by the Buckman Laboratories, Inc. Assisting in the management of the company, Mr. T. Jay Barbour, a petroleum engineer, is a graduate of the Colorado School of Mines. Mr. Barbour was previously associated with the Frontier Refining Company and later with the Chapman Chemical Company.

Pangborn Expansion

PANGBORN CORPORATION of Hagerstown, Md., has completed a new addition to its production facilities in Hagerstown.

Designed with adequate head-room for the production of new taller, automatic blast cleaning equipment, the building is 65 ft wide and 205 ft long. One five-ton and one ten-ton crane have been installed to facilitate materials handling in the production area. The importance of materials handling is indicated by the expenditure of \$50,000 for truck loading docks out of the total \$300,000 cost of the building.

Hanlon Award

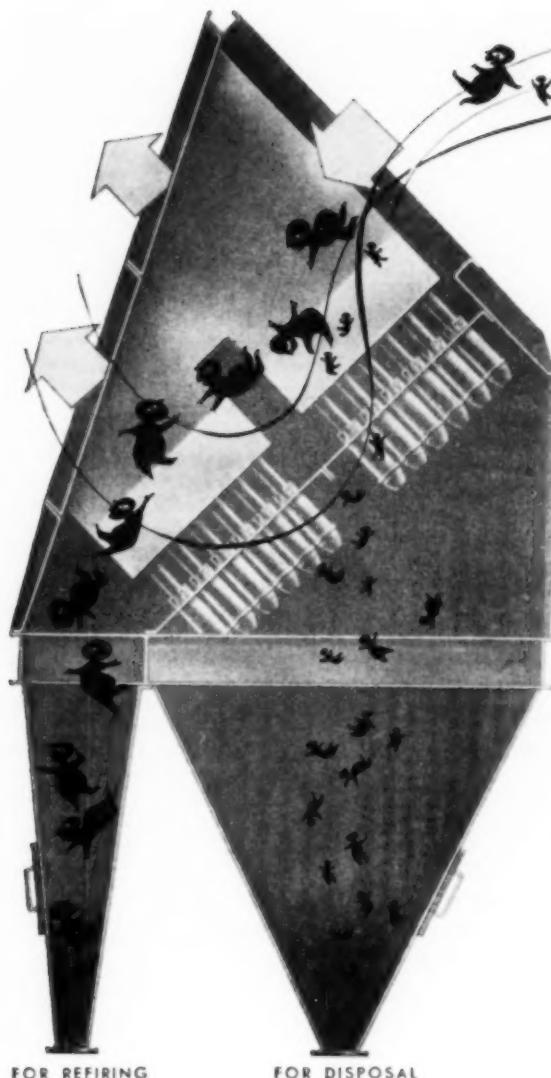
The Hanlon Award, highest honor in the natural gasoline industry and one of the ranking awards of the entire petroleum industry, has been conferred on Darst E. Buchanan, President, HIWAN OIL & GAS COMPANY, HOUSTON, TEXAS.

Mr. Buchanan is the seventeenth recipient of the Hanlon Award which is conferred each year by the NGAA for outstanding service to the natural gasoline and cycling industries. Donor of the Award is Mr. E. I. Han-

the



Decantation Principle



**Catches the small ones
(flyash) and lets the
big ones go . . .
back to the boiler for refiring**

Separation of the fines from coarse high carbon flyash for refiring is at last possible in one unit, with no added pressure drop.

Prat-Daniel's Tubular Dust Collector, arranged for Decantation, permits efficient refiring of high carbon dust *without* recirculating the fines!

The P-D two-stage tubular collector is combined in *one* unit yet is no larger in area than a standard P-D Collector. In operation, it requires no additional pressure drop yet assures an extremely high efficiency in the range below 20 microns!

The Thermix Corporation—Project Engineers for Prat-Daniel—will be glad to show you how Decantation saves fuel and eliminates poor combustion resulting from total re-injection.

Ask them for full details on P-D Dust Collectors, Fan Stacks, F.D. and I.D. Fans. P-D Unit Responsibility on these components relieves you of the necessity of integrating equipment from various sources . . . helps make your operation more efficient, less costly. It will pay you to call Thermix today.

Ask for P-D Catalog 4-P201.



FOR REFIRING

FOR DISPOSAL

Project Engineers

THE THERMIX CORPORATION
GREENWICH, CONN.

(Offices in 38 Principal Cities)

Canadian Affiliates: T. C. CHOWN, LTD., Montreal 25, Quebec, Toronto 5, Ontario

Designers and Manufacturers

PRAT-DANIEL CORPORATION
SOUTH NORWALK, CONN.

POWER DIVISION: Tubular Dust Collectors, Forced Draft Fans, Air Preheaters, Induced Draft Fans, Fan Stacks.

APPROVED

Okadée

"PERFECT SEAL"

VALUES

for
Bubble-tight
Primary
Shut-off in
L P G A S L I N E S



Underwriters' Laboratories, major LP gas producers*, and Liquified Petroleum Gas Commissions of several States* approve Okadée Valves for primary shut-off in LP gas lines. In addition, Okadée Valves are used in virtually all types of gas and liquid lines at pressures to 600 p.s.i. and temperatures to 800° F.—wherever a perfect seal, low maintenance and long life are necessary.

Get complete data, including material specifications, on Okadée Valves — and newest Underwriters' Laboratories test report—without obligation, today.

*Names on request.

- A. S. A. Standard dimensions
- Sizes from $\frac{1}{2}$ " to 6"
- Single- and double-seated disc valves
- Hard-faced valves and seats . . . perfect metal-to-metal seal
- Self-cleaning, self-compensating valve discs
- Lever, rack-and-lever, or worm-gear operation
- Non-lubricated
- No wedge action
- Valves and seats wear in instead of "wearing out"
- All parts quickly replaceable in the field
- Inside and outside stem packing . . . double assurance against stem leaks

Underwriters' Laboratories Reexamination Service Guide No. 141 A3.1.22, File MH5163. SL Screwed Type Series and Series 15 and 30 Flanged Type Okadée Valves are suitable as a positive shut-off in LP gas pipelines and other LP gas applications for a working pressure of 250 p.s.i.

Write for Bulletin No. 51FL



news (continued)

lon, Chairman of the Board of the National Bank of Tulsa, Tulsa, Oklahoma, and a pioneer in the natural gasoline business.

Public Service Co. Officers

Directors and officers of PUBLIC SERVICE COMPANY OF OKLAHOMA were re-elected at the annual meeting in the company's headquarters office in Tulsa, it was announced by R. K. Lane, president.

Re-elected with long time records of service with the company are: C. N. Robinson, Harry W. Pitzer and Wright Canfield, vice presidents; N. I. Boaz, secretary; Floyd H. Baxter, treasurer and assistant secretary; Elmer K. Higley, controller; C. H. Meyer, assistant secretary; Lewis S. Coby, assistant treasurer, and E. E. Ehret, assistant treasurer.

Directors re-elected are: Ray H. Babbitt, Lawton; P. H. Bohart, Tulsa; D. D. Bovaird, Tulsa; J. Fred Conner, Clinton; J. A. LaFortune, Tulsa; J. F. Cronin, Bartlesville; Harry W. Pitzer, Chickasha; D. J. Tuepker, Tulsa, and R. K. Lane, Tulsa.

U. S. Plywood Expansion

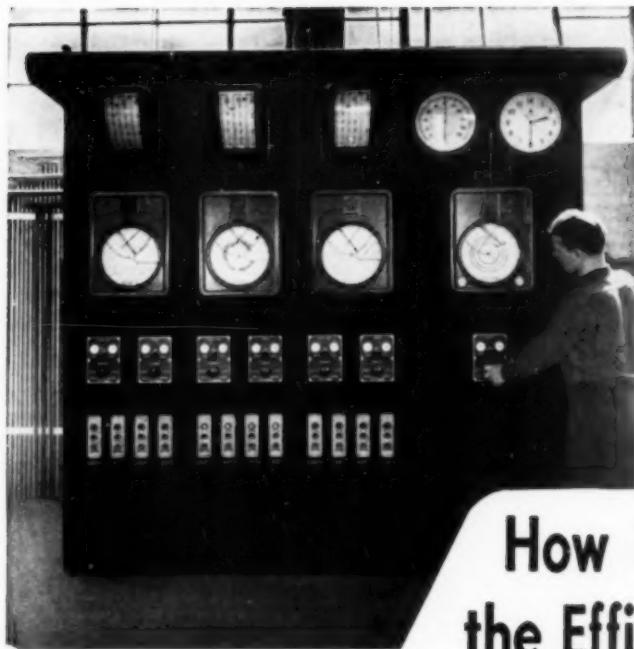
THE U. S. PLYWOOD CORPORATION has added another office section to its plant at ORANGEBURG, S. C. This addition is the most recent in a series of expansions at this plant, the last three of which were handled by the Daniel Construction Company of Greenville, S. C., and Birmingham, Alabama.

Electric Energy, Inc. Award

One of the nation's youngest electric utility companies, with only a single customer, won the electrical industry's top honor when ELECTRIC ENERGY, INCORPORATED was presented the Charles A. Coffin Award for outstanding achievement during 1952.

Ralph J. Cordiner, president of the General Electric Company, made the presentation to J. W. McAfee, president of Electric Energy, Incorporated, during the Edison Electric Institute's 21st annual convention. B. L. England, president of the Institute, was in charge of the special ceremony.

The award-winning company was established in 1950 to supply electric power to the Atomic Energy Commission project at Paducah, Kentucky.



These Bailey Boiler Controls at the Chicago Pneumatic Tool Company's new plant in Utica, N. Y., insure efficient operation of three 25,000 lb per hour, 100 psi, spreader stoker-fired boilers.

How to INCREASE the Efficiency of YOUR BOILER-ROOM DOLLAR

Before you get steam you've got to spend dollars—so dollars are a form of energy.

And if your boiler-room dollars are invested in equipment that isn't working efficiently, economically, your "investment" is poor.

That's where co-ordinated controls by Bailey can help. Here's why they'll increase your "boiler-room investment efficiency":

1. Complete Range of Equipment—fully co-ordinated.

You need never worry that a Bailey Engineer's recommendation is slanted in favor of a particular type of equipment, just because he has a limited line to sell—or that Bailey will pass the buck for efficient control; we offer *complete* boiler control systems.

2. Engineering Service—backed by experience.

No other manufacturer of instruments and controls can offer as broad an experience, based on successful installations involving all types of combustion, flow measurement and automatic control.

3. Direct Sales-Service—conveniently located near you.

Bailey Meter Company's sales-service engineers are located in more

industrial centers than those of any other manufacturer of boiler control systems; you get prompt, experienced service with a minimum of travel time and expense.

For better "boiler-room investment" efficiency—for more power per fuel dollar, less outage and safer working conditions, you owe it to yourself to investigate Bailey Controls. Ask a Bailey engineer to arrange a visit to a nearby Bailey installation. We're proud to stand on our record: "More power to you!"

A-III-G



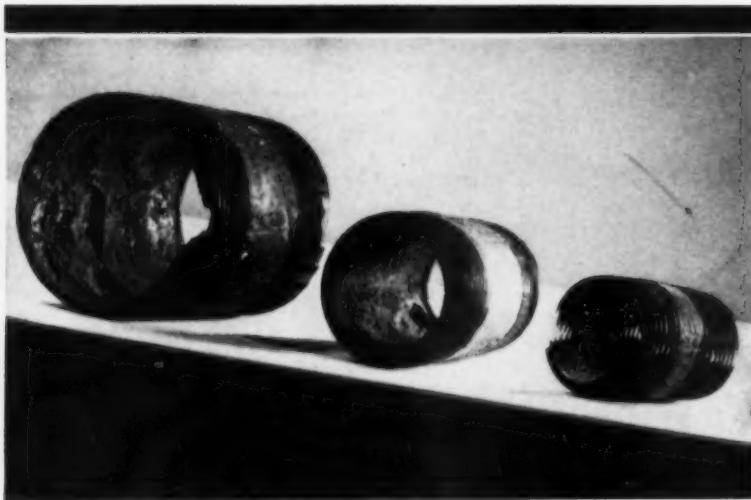
BAILEY METER COMPANY

1028 IVANHOE ROAD
CLEVELAND 10, OHIO

Controls for Steam Plants

COMBUSTION - FEED WATER
TEMPERATURE - PRESSURE
LIQUID LEVEL - FEED PUMPS

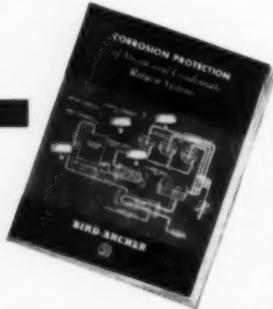
STOP CORROSION with BIRD-ARCHER AMINE TREATMENT



Unretouched photograph shows the ravages of corrosion on condensate return lines.

Corrosion of piping in steam and condensate return lines is an expensive two-way headache. (1) It leads to large outlays for pipe replacement and maintenance. (2) It often results in plugged return lines and traps due to the solid products of corrosion. Bird-Archer Amine Treatment effectively eliminates these troubles at low cost.

Here's how. Amines are fed into the boiler or into the steam and condensate systems. The amines raise the pH value of the condensate and also tend to inhibit equipment-destroying corrosion through surface protection of the metal itself. In scores of plants, this Bird-Archer system has more than paid for itself by substantially cutting replacement and maintenance costs.



BA-922

Bulletin CP 100
gives all the facts on
Bird-Archer Amine Treat-
ment. Write for your copy.



BIRD-ARCHER WATER TREATMENT

THE BIRD-ARCHER COMPANY, 4337 NORTH AMERICAN ST., PHILADELPHIA 40, PA.
NEW YORK • CHICAGO

IN CANADA: The Bird-Archer Co., Limited, Cobourg, Ontario

IN MEXICO: Calderas y Accesorios, S. A., Amsterdam 291, Mexico, D. F.

news (continued)

Bailey Appoints Gorrie

H. H. GORRIE, assistant chief engineer of BAILEY METER COMPANY, has been appointed chief engineer, directly in charge of the company's engineering activities.

Gorrie, who started with the company in 1927, is a graduate of Rensselaer Polytechnic Institute.

Columbia-Southern Expands

COLUMBIA - SOUTHERN CHEMICAL CORPORATION, subsidiary of Pittsburgh Plate Glass Company, announced that additional chlorine-caustic soda producing units have been placed in operation at the firm's plants located at NATRIUM, WEST VIRGINIA, and CORPUS CHRISTI, TEXAS.

The new production lines will enable the firm to double production capacity at Corpus Christi and increase Natrium capacity by approximately 35 per cent.

In conjunction with the chlorine-caustic soda production line at Corpus Christi, a gas fired steam boiler and a hydrogen cooled turbo-generator have been installed. Additional power producing facilities are being added at the West Virginia plant.

Clarostat—South, S.W.

The assignment of additional territories to two of its Southern sales representatives is announced by CLAROSTAT MFG. CO., INC., Dover, N. H., manufacturers of resistors, controls and resistance devices, as follows:

JAMES MILLAR ORGANIZATION, 1036 Peachtree St., N.E., or P. O. Box 116 Station C, ATLANTA, GA., takes on the additional territory of Memphis, Tenn., and the entire state of Mississippi.

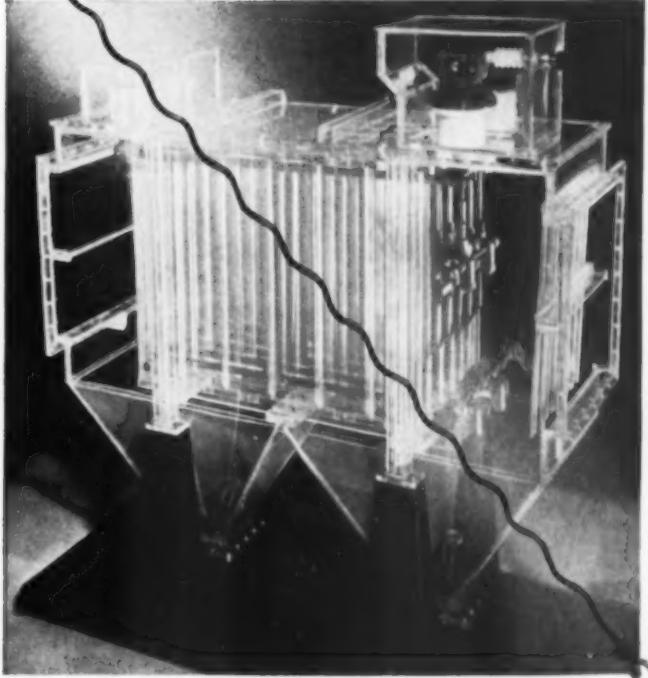
J. Y. SCHOONMAKER, 2011 Cedar Springs, DALLAS, TEXAS, is adding to its coverage the states of Louisiana and Arkansas.

Sprague Electric—N. C.

SPRAGUE ELECTRIC COMPANY, North Adams, Mass., is building a new plant in NORTH CAROLINA, which will employ about 250 workers when it reaches full schedule production. The new plant will manufacture capacitors, the most important of the many types of electronic components made by the company.

Location of the plant is near West Jefferson, which is only a few miles

*The exclusive
Buell
Spiralelectrode
assures superior
electrical
operation. One
of many exclu-
sive features.*



New **Buell** Electric Precipitator

features: • **superior electrical system** • **lowest maintenance possible**
• **longest service life** • **most efficient collection**

Now it can be told:

Frankly, on the job reports coming in from several installations have *proved* the soundness of Buell design.

The *Spiralelectrode* (an exclusive Buell advantage) is setting a new high in collection efficiency.

Simplicity of design is dramatically reducing maintenance costs.

Long service life and unmatched reliability come from extra heavy-duty construction.

The accurate scale model (above) clearly

demonstrates many of the new and exclusive features and ideas. It is available for inspection by executives interested in solving industrial dust problems in the most effective, economical and practical way yet possible.

For operating and performance facts as well as complete details write Dept. 80-I, Buell Engineering Company, 70 Pine Street, New York 5, New York.

bueLL®



20 Years of Engineered Efficiency
DUST COLLECTION SYSTEMS



The drop-tight fit of a Dart is directly traceable to the precision grinding of its two bronze seats which form a true ball joint. No need to strain with a wrench — fastening and uncoupling are equally easy. Because the seats stay "healthy" Darts can be used over and over again — *to cut costs!* See your supplier today.

QUICK FACTS

- Dart's heavy shoulders can withstand any amount and degree of wrenching
- Dart's extra-wide bronze seats resist pitting and corrosion
- Dart's nut and body are practically indestructible — they're air-refined, high test, malleable iron

DART UNION COMPANY
Providence 5, Rhode Island
The Fairbanks Co. — Distributors
Boston-New York-Pittsburgh-Rome, Ga.

DART
UNIONS

news (continued)

from both the Tennessee and Virginia state lines. It is expected that the plant will start operation about November 1 of this year. The new factory will be of modern design in steel and red brick construction and will contain 50,000 sq ft of floor space. Process water for the manufacturing operations will be taken from the New River, purified, and returned to the river after being passed through a filter plant to be built by the company. Power for the manufacture of capacitors will be furnished by the Blue Ridge Electric Membership Corporation and the I. R. E. A. Cooperative.

Brunner—Gainesville, Ga.

BRUNNER MANUFACTURING COMPANY, 1821 Broad St., Utica, N. Y., has construction well under way on a new factory at GAINESVILLE, GEORGIA.

The windowless building is being built of brick, completely air conditioned, with fluorescent lighting. New production equipment is to be installed, and the entire plant represents an investment of over \$1,500,000.

Entire production will be devoted to the manufacture of the Brunner-Metic refrigeration compressor. Beginning with the fall opening of the plant, semi-hermetics from $\frac{1}{4}$ through 2 hp will be available. Later an entire range of units through 5 hp will be manufactured.

As this plant will be operated entirely separately from the Utica plant, no open type production is scheduled. A warehouse to serve the entire Southeastern area will however be maintained. Plans call for stocking a wide range of air compressors in addition to large and small refrigeration units in Gainesville for the convenience of all Brunner customers.

Elliott Company—Tulsa

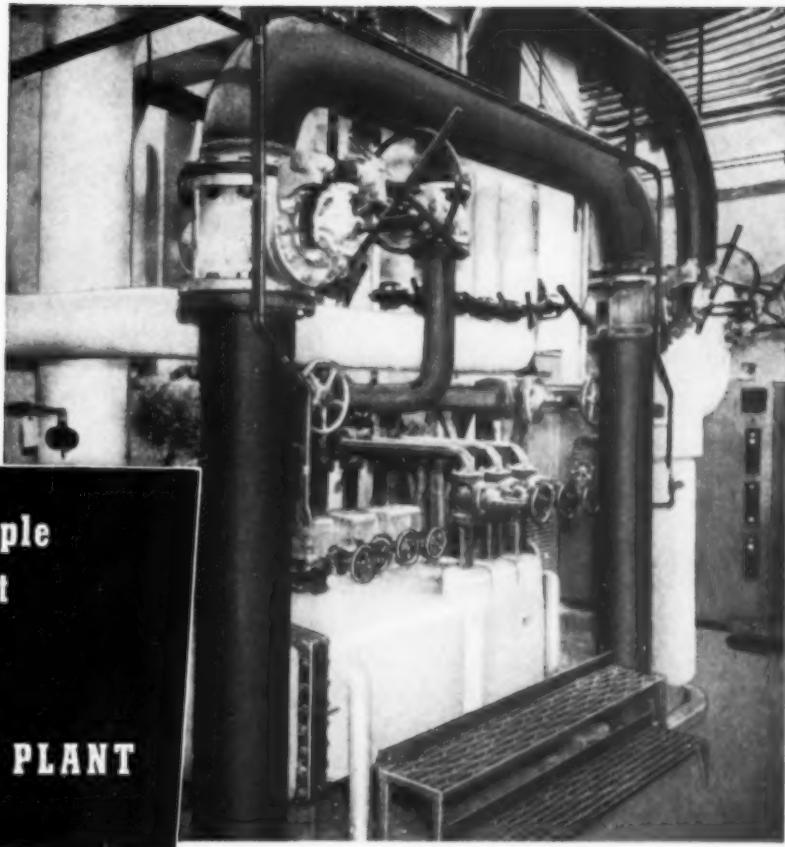
ELLIOTT COMPANY, Jeannette, Pa., has moved its district office in TULSA, OKLA., from its previous location in the McBirney Building to 910 Petroleum Building, Tulsa.

Refrigeration and Air Conditioning Exposition

Demonstrations of the growing uses of refrigeration and air conditioning as a means of increasing industrial production, reducing costs and improving quality will be the highlight



**How CONSECO Triple
Element Steam Jet
Air Ejectors Help
Trim Costs at . . .
HARBOR STEAM PLANT**



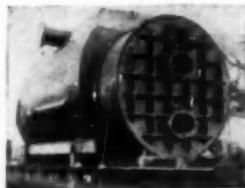
CONSECO service is available for designing, manufacturing and installing Steam Jet Air Ejectors for all requirements of the power, chemical and process industries . . . Write for a copy of our new Engineering Bulletin No. 103, describing Conseco Ejectors in detail and giving valuable technical information

**SEE US AT BOOTH 76
NATIONAL POWER SHOW
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INCLUDES:**



DEAERATORS



CONDENSERS

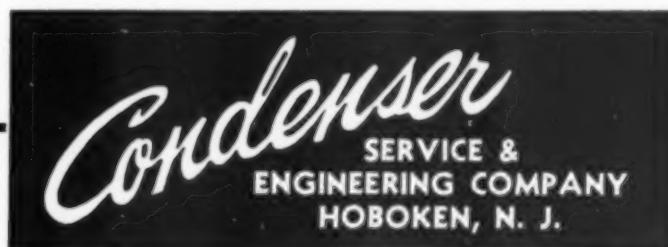


CLOSED HEATERS



EVAPORATORS

THESE triple element, two-stage Conseco Air Ejectors constitute parts of units No. 3, 4 and 5 which are installed in the Harbor Steam Plant, Los Angeles, California. Each ejector operates with steam at 400 psig, 850 deg. FTT and serves a twin 70,000 sq. ft. Conseco Condenser handling a 75,000 kw turbine





★ SUBOX PROTECTS . . .

maximum resistance to rust, weather, steam, moisture, condensation, oils, and cleaners.

★ SUBOX DECORATES . . .

metallic finishes right in the *first coat* — no over-coat is necessary. One Subox color for all structural steel creates harmony.

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self-priming means fewer coats. A single coat for interiors and a double coat outdoors gives adequate protection.

★ SUBOX REQUIRES NO UNDERCOAT . . .

durable lead base in Subox paints allows repainting again with the same material or acts as enamel under-coat.

★ SUBOX CUTS COSTS . . .

no priming touching up is necessary in interior shop-coated steel before applying Subox paints.

SPECIFY SUBOX . . .

time-tested for more than 25 years

*Write today for your free copy of informative article on how to cut painting costs with "Plan Painting."



news (continued)

of the eighth REFRIGERATION & AIR CONDITIONING EXPOSITION, according to W. A. Siegfried, president, Superior Valve & Fittings Co., Pittsburgh, who is general chairman of the exposition.

The show, held every two years, will take place Nov. 9-12 at the Public Auditorium, Cleveland. Over 200 companies will be exhibitors.

The exposition will be the largest ever held in the field and will constitute the world's largest display of refrigeration and air conditioning equipment.

Bellows Field Engineers

THE BELLows CO., Akron, Ohio, announces appointment of Field Engineers with the following headquarters: Michael J. Vancheri, 727 Penn Ave., Wilkinsburg 21, Pa.; Thomas J. Garfield, 69 Lincoln Park, Newark 2, N. J.; William Hultgren, 70 East 45th St., New York 17, N. Y.; and Daniel J. Rowan, 183 Hartford Ave., Providence 9, R. I. These men will handle the complete line of Bellows "Controlled-Air-Power" Devices.

Feedrail Corp.—Florida

ELMER W. RASMUSSEN has been appointed representative for the State of Florida, east of and including the counties of Leon and Wakulla, for the FEEDRAIL CORPORATION, New York, manufacturers of industrial trolley busway electrification systems. He succeeds Mr. F. C. Picker, who has retired because of ill health.

New offices are located in the Court Square Building, 606 Court Street, Clearwater, Florida.

Delta Tank Mfg Co. Expands

THE DELTA TANK MANUFACTURING COMPANY, INC. OF BATON ROUGE, LA., the nation's largest manufacturer of containers for liquefied petroleum gas, is having a third manufacturing plant constructed at Beardstown, Ill.

The new plant, a 24,000 sq ft standardized steel-frame structure fabricated by the Luria Engineering Company of Bethlehem, Pa., will enable the concern to sharply step up its output of pressure vessels, tanks and cylinders for use as containers for liquefied petroleum gas.

The concern's present manufacturing plants are in Baton Rouge and Macon, Ga. Future expansion plans provide for additional buildings in both Beardstown and Macon.

Trane Co., Columbia, S. C.

THE TRANE COMPANY, La Crosse, Wis., manufacturer of heating, ventilating and air conditioning equipment, announces that the new location of its COLUMBIA, SOUTH CAROLINA sales office is 2740 Devine Street.

ARTHUR M. SUGGS is the sales engineer in charge of the office.

Trailmobile—Atlanta

Appointment of LOU C. DOSS, of ATLANTA, GA., as division manager of the newly-formed southern sales division of TRAILMOBILE INC., manufacturers of commercial truck-trailers, was recently announced by William A. Burns, president.

Honeywell Industrial Div.

Twenty-five sales engineers were recently added to the field sales force of MINNEAPOLIS-HONEYWELL REGULATOR COMPANY'S Industrial Division, it was announced by J. A. Robinson, field sales manager.

The new appointees, all recent graduates from the company's industrial instrument training school in Philadelphia, reflect the long-range expansion of the company's sales organization to meet the increased complexities of the firm's industrial marketing problems. It was pointed out that of the nation's 250,000-odd manufacturing firms, some 65,000 buy 80 per cent of the industrial instruments produced. Of this total, 25,000 represent new customers since the start of the Korean incident, leaving at least 185,000 firms as potential instrument customers.

Texas Eastern Appointments

EMMETT L. COLVIN has been appointed assistant division manager of TEXAS EASTERN TRANSMISSION CORPORATION'S division one, located at LITTLE ROCK. He was formerly division engineer.

Before coming with Texas Eastern, Colvin was general manager of Southern Switch and Signal Company of Shreveport, Louisiana. He is a graduate of Louisiana Polytechnic Institute, receiving his B. S. in mechanical engineering.

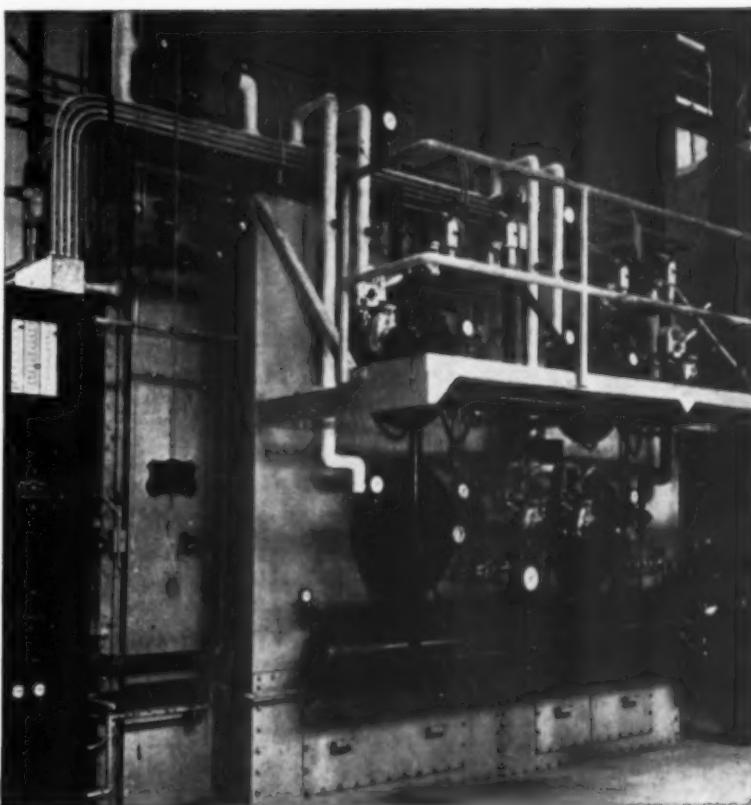
Colvin is replacing ROBERT S. COOPER, who has been transferred to DALLAS, TEXAS, to take a position as superintendent of pipelines and compressor stations with Wilcox Trend Gathering System, Inc., an affiliate of Texas Eastern.

ENCO

GAS-OIL

BURNERS

for
LOWER
Fuel Costs



The Enco gas-oil burners in this boiler will burn oil or gas—or both. The change-over is simple and is made according to the availability or cost of these fuels. Thus the plant can avoid a shut-down when one fuel cannot be obtained, or can

switch from one fuel to the other according to the relative prices or the cost per btu. Combustion is uniform with either fuel or both, even though steam demands swing sharply—another fuel-saving, money-saving feature.

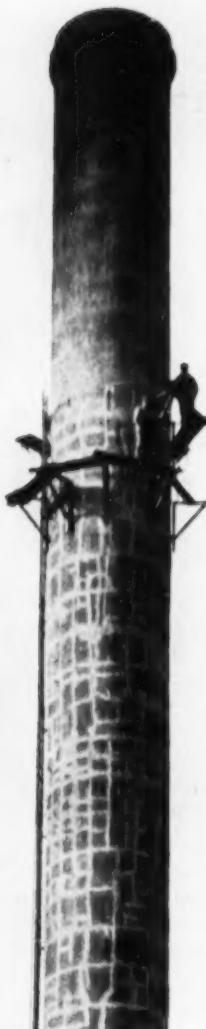
Other Enco burners offer similar economies for boilers of practically all sizes and types.

We invite inquiries on all burner problems—including those involving a wide range of capacities with a demand for complete atomization. We have had 35 years of experience in this field.

THE ENGINEER COMPANY

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IN CANADA: ROCK UTILITIES LTD., 80 JEAN TALON ST. W., MONTREAL, P. Q.

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A planned program of repair and inspection means profits for you

Like money in the bank—that's what a chimney in good repair can mean to you. As it is one of the most expensive and most important parts of the equipment of your plant, your factory chimney should have constant and careful attention.

Whether your chimney is of brick, steel, or concrete, its maintenance should not be neglected. If ignored, and allowed to become cracked and corroded, industrial chimneys can easily become operating liabilities and threats to safety.

Make sure you are not losing money by neglect of your chimney. A system of planned inspection and repair can be like money in the bank for you.

Turn to the expert engineers and inspectors of Custodis. Throughout the United States and Canada they are constantly solving chimney problems. The list of satisfied customers of Custodis, built over fifty-one years of service, includes most of the progressive industrial organizations on this continent.

Any job, large or small, receives our careful attention and the benefits of our long experience, sound engineering, expert supervision and skilful workmanship.

CUSTODIS CONSTRUCTION COMPANY, Inc.

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CHICAGO
22 West Monroe St.
RA 6-3614

news (continued)

Stewart at Kingston Plant

ERNEST L. STEWART, formerly assistant to the superintendent of the By-Products and Coke Plants of Woodward Iron Company, has recently returned to the Tennessee Valley Authority's Power Division, in the construction and operation of its Kingston Steam Plant.

Mr. Stewart is a member of the A.S.M.E. and the Engineers Club of Birmingham, Alabama. His address is 525 Cumberland St., Harriman, Tenn.

Mississippi Power Company Gets Safety Award

MISSISSIPPI POWER COMPANY has received a certificate from the National Safety Council in recognition of winning second place in the 1952 Public Utilities Safety Contest, S. L. Muths, vice-president and general manager of the company, announced recently.

During the year employees worked 1,340,824 man hours with only two disabling accidents which gave a frequency rate of 1.49 accidents per million man hours worked.

During the past year Mississippi Power Company received the Safety Merit Award of the Edison Electric Institute for working 1,000,000 consecutive man hours without a disabling accident and the Award of Merit from the National Safety Council for a noteworthy safety performance. DON McCULLOCH is Supervisor of Safety for the Company.

Allis-Chalmers —Texas and Louisiana

THE THERMAL SUPPLY COMPANY, 2002 McKinney, HOUSTON, has been named a distributor for ALLIS-CHALMERS motors, controls and pumps in sections of TEXAS and LOUISIANA.

Area served by the new distributor in Texas is that east of and including Burleson, Washington, Austin, Colorado, Wharton, and Jackson counties; south of and including Brazos, Grimes, Walker, San Jacinto, Polk, Tyler, Jasper, and Newton counties. In Louisiana, the supply firm is serving Beauregard, Allen, Calcasieu, Jefferson Davis, and Cameron parishes.

ELMER PETERSON is president and owner of the Thermal Supply Company, which was established in 1950.

Combustion Control Corp. Tulsa and Memphis

COMBUSTION CONTROL CORPORATION of Boston, Mass., manufacturer of flame failure safeguard controls, announces the appointment of SNYDER COMPANY, INC., 2604 Kermit Highway, ODESSA, TEXAS, as acting sales and service representative covering southwestern Texas. This is a branch office of Snyder Company, Inc., of Tulsa, Oklahoma.

Combustion Control Corporation also announces the appointment of INDUSTRIAL BOILER & EQUIPMENT COMPANY, 975 Jackson Avenue, MEMPHIS, TENNESSEE, as sales and service representative whose territory includes the states of Arkansas, Mississippi and Tennessee west of the Tennessee River. Contact may be made through Mr. Luther H. Huckabee or Mr. Thomas Holeman.

ALCOA—Rockdale, Texas

Extensive drying facilities will be built for large-scale use of lignite as a major power source for a smelting plant of the ALUMINUM COMPANY OF AMERICA near ROCKDALE, TEXAS, according to THE RUST ENGINEERING COMPANY, the constructor.

The new drying facilities will provide dried lignite to heat three large steam boilers of the Sandow Power Plant which will serve the Aluminum Company's new Rockdale Works located about 50 miles northeast of Austin, Texas.

This will represent the first use of lignite for industrial power production on such a scale. The dryer units, in groups of three, are scheduled for completion a month apart with the final group to be ready for operation toward the end of this year.

Potomac Edison Appointments

MARTIN J. URNER has been named THE POTOMAC EDISON COMPANY'S Transmission and Distribution Engineer and CHARLES C. WOLF has been named his assistant in a consolidation of these two departments following the retirement of former Distribution Engineer C. C. Moler. They will have office headquarters in HAGERSTOWN, MARYLAND.

Urner has been transmission engineer since 1948 and has been with the company since 1925.

Charles C. Wolf was formerly maintenance engineer in the company's Construction Department.



NOW OFFERS

**ONE OF THE SOUTH'S LARGEST
FACILITIES FOR
HOT-DIP GALVANIZING**

• CASTINGS
• FABRICATED PARTS
• EXPANDED METAL
• PIPE
• TANKS
• STRIP
• BARS
• PLATES

New Tank Size

4 FT. WIDE
6 FT. DEEP
25 FT. LONG

Double-dipping affords accommodations for pieces up to 45 feet long.



If it's exposed to rust—hot-dip galvanize it!

FABRICATING DIVISION

Atlantic Steel Company

ATLANTA, GEORGIA • EMERSON 3441

news for the South and Southwest (continued)

Lion Oil Co., New Orleans

ROSCOE L. VAN ZANDT has been named superintendent of The Barton Plant, LION OIL COMPANY's new chemical plant near NEW ORLEANS, according to an announcement made by J. B. Rogerson, Lion's manager of manufacturing. Others assigned to management positions at the plant include STANLEY B. JOHNSON, assistant

superintendent; JOHN L. RICKS, chief engineer; H. LEON PAYTON, operating superintendent; FRED B. ELLIOTT, maintenance superintendent; MALCOLM C. LOWE, chief chemist; CARY E. ASHLEY, personnel manager; and DEWEY BLACKWOOD, safety engineer.

All eight of those named have been transferred from the company's headquarters at EL DORADO, ARKANSAS. Payton and Lowe are in New York as

Lion's representatives, working with the architect-engineers who are designing the plant. The others have been at the site of the new plant for some months supervising construction and equipment installation.

The Barton Plant, which is expected to cost approximately \$31,000,000, has been under construction since the middle of last year and is expected to go into operation during the second quarter of 1954. It is located 14 miles upstream from New Orleans on the west bank of the Mississippi River on a site of about 1400 acres. It is served by the Texas and Pacific Railway at its Luling station and by the Southern Pacific Railroad, on which the station designation is Boutte. When completed the plant will employ approximately 500 persons from the New Orleans area.



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- LONG LIFE
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We factory-fit this one-piece Open Steel Flooring to your dimensions for easy installation. You can cover dangerous open areas and add useful space inside and out.

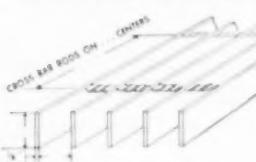
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Please send prices on _____ sq. ft. Grating as per specifications marked at right.

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CITY _____ ZONE _____ STATE _____

BLAW-KNOX ELECTROFORGED®
STEEL GRATING

G.E. to Build New Motors

GENERAL ELECTRIC has announced that it will build polyphase motors with the new frame standards recently approved by the National Electrical Manufacturers Association.

The company estimates that its new 182 and 184 frame polyphase motor designs will be completed and samples available by late fall of this year. Larger frames will be made available at later dates, and quantity production of the new motors will follow shortly after the availability of samples.

According to G.E. engineers, the new motor frame assignments will allow better utilization of space within motor frames and result in greater horsepower per frame size, by taking advantage of better materials and advances in the art of motor designing. Performance characteristics such as torques, starting currents, and temperature rise will remain unchanged.

Marley Co.—Houston

A change of address and a new manager for its HOUSTON, TEXAS, sales office are announced by THE MARLEY COMPANY, KANSAS CITY, Mo., manufacturer of cooling towers and water cooling equipment.

To give necessary space for the expanding Houston Plant, the Marley sales office has been moved to a separate office at 1601 Commerce Building in downtown Houston.

Roy W. MAZE is manager of this sales office. Mr. Maze joined the company in 1946 as advertising manager. In 1950 he was promoted to management of the Merchandising Sales Department.

T.C.I.—Tin Mill Products

The establishment of a Tin Mill Products Division of the Sales Department of the TENNESSEE COAL & IRON DIVISION of UNITED STATES STEEL CORPORATION, BIRMINGHAM, ALABAMA, has been announced.

J. E. HILL, superintendent of the Fairfield Tin Mill, has been appointed to head the new activity as Manager of Sales.

Succeeding Mr. Hill as tin mill superintendent will be ROMAN J. MEYER, superintendent of the Fairfield Sheet Mill.

D. A. HAARBAUER, formerly assistant superintendent of the Fairfield Sheet Mill, advances to superintendent, and M. F. GLASCOCK is promoted to assistant superintendent of the Fairfield Sheet Mill.

The sale of TCI tin mill products has heretofore been handled as a general sales function, but because of the growing diversity of uses for products from the tin mill, as well as an expanding customer list, it was necessary to establish a division devoted exclusively to the sale of such products.

Other products divisions in TCI's Sales Department include the Sheet and Wire Division, Railroad Products Division, Hot Rolled Products Division, Electrical and Wire Rope Division, Construction Materials, Stainless Steel Division and Basic Slag Division.

Virginia Electric Power Director of Purchases

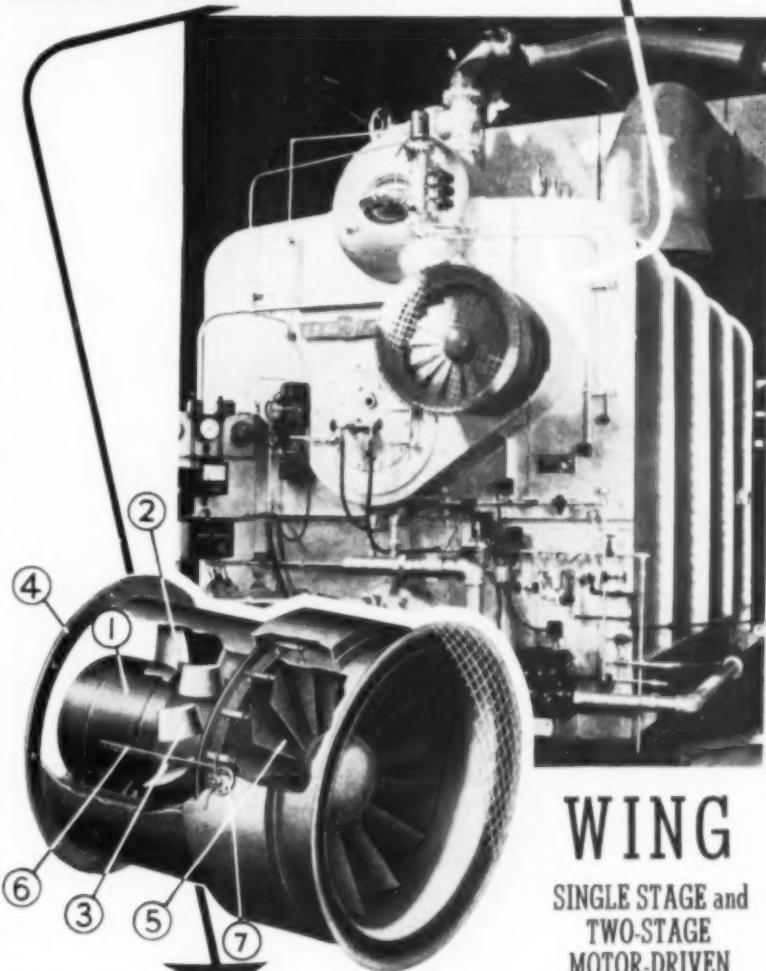
VIRGINIA ELECTRIC AND POWER COMPANY, Richmond 9, Va., has announced the appointment of LOUIS E. DAVIS as Director of Purchases. He will have direct charge of all of the purchasing activities of the entire company.

Mr. Davis has had a wide and varied experience in the electric utility field, both with this company and the Stone & Webster Engineering Corporation of Boston, Mass.

In taking over his new work, Mr. Davis relinquishes two jobs which he has held simultaneously for the past six years. As Assistant Superintendent of Production, he was in effect general superintendent of all steam-electric generating stations, and in the Engineering and Construction Department he held the title of Supervisor of Steam Station Design Engineering.

Just recently Mr. Davis returned from Washington where he had been on loan to the government in the Department of the Interior for sixteen months, serving the Defense Electric Power Administration as Engineering Consultant.

Efficient



WING

SINGLE STAGE and
TWO-STAGE
MOTOR-DRIVEN

FORCED DRAFT BLOWERS

WING Motor-Driven, Forced Draft Blowers are the result of years of pioneering with the airfoil design of the axial-flow fan. Each part of the Wing Blower is made to produce and control the air flow into the furnace for maximum firing efficiency. Sturdy construction, compact design, quiet performance, Voltrol Vanes, (permitting capacity regulation down to 10% of max.) plus low installation cost—are features of Wing Motor-Driven Blowers. Write for Bulletin SW-1a.

L. J. Wing Mfg. Co.

169 Vreeland Mills Road
Linden, New Jersey

Factories: Linden, N.J. and Montreal, Can.



news for the South and Southwest (continued)

U. S. Rubber Expands—Tenn.

Ground is being broken for a major expansion of Shelbyville Mills, UNITED STATES RUBBER COMPANY'S textile mill in SHELBYVILLE, TENN., which will give employment to approximately 200 additional people next year.

The expansion includes a one-story addition to the main mill building

covering more than 67,000 sq ft of floor space. Production in the new structure probably will start early in 1954. The plant produces tire chafing fabric, tufting yarns and rayon tire cord.

Nitrogen Plant—Louisiana

The first post war plant built to help meet the world-wide nitrogen shortage will be completed and in pro-

duction for the 1953-54 fertilizer year, it was announced by COMMERCIAL SOLVENTS CORPORATION.

The new facilities are part of Commercial Solvents' STERLINGTON, LOUISIANA, plant and will double the company's present output of nitrogen for agricultural and industrial use. In addition to increasing present output of anhydrous ammonia, the new production units will add two important basic sources of nitrogen to the company's agricultural chemical line. These are Dixsol nitrogen solutions for mixed fertilizers and crystalline ammonium nitrate fertilizer used principally for direct application to the soil.

R. W. BREIDENBACH has been named assistant to Clyde Marshall, general manager of the Agricultural Chemicals Division. Mr. Breidenbach will direct the development of distribution for the increased production volume from the new facilities.

The new facilities were built at a cost of \$20,000,000. They are the first of the chemical industry's privately financed nitrogen expansion programs aimed at a 70% increase in production by 1956.

Farr Co. Representatives

FARR COMPANY of Los Angeles announces the appointment of AIR FILTER SALES & SERVICE CO., JACKSON, MISS., and AIR FILTER SALES & SERVICE CO., NASHVILLE, TENN., as representatives in their respective areas for FAR-AIR Products.

MARSHALL, NEIL & PAULEY, INC., TEXAS and LOUISIANA representatives for Farr, have organized a subsidiary company in New Orleans, the Air Filter Company, to handle FAR-AIR sales and certified filter service in the New Orleans territory.

Rust-Oleum Corp.—Miss.

THE RUST-OLEUM CORPORATION, 2799 Oakton Street, Evanston, Illinois, manufacturer of rust-preventives, announces the addition of MILL SUPPLIES, INCORPORATED, Box 2762, Highway 82, East, GREENVILLE, MISSISSIPPI, to its distributor sales organization.

National Instrument Exhibit

THE NATIONAL INSTRUMENT EXHIBIT has increased its space to 34,000 sq ft for the 1953 Exhibit in Chicago, and all space has been sold.

The Exhibit runs from September 21 to 25, 1953, at the Sherman Hotel in Chicago.



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We are specialists in burners and
boilers, too!

IN GEORGIA
THOMASVILLE DIVISION
PHONE 840
ATLANTA DIVISION
RAY HEAT EQUIPMENT CO.
PHONE EVERgreen 1058

new equipment (continued)

For more data circle item code number
on the postage free post card—p. 17

(Starts on Page 8)

stops located on the exterior. The lever may be assembled by the user in any of four radial positions spaced 90 degrees apart. Full range of speed is achieved with only a 60 degree arc of the lever.

Busway Tapping Device

I-8

TRUMBULL ELECTRIC DEPARTMENT of the GENERAL ELECTRIC COMPANY,

Plainville, Conn., has developed a new device, called an FG Flex-A-Plug, designed for use with the Trumbull Flex-A-Power Distribution system for getting power from overhead busway to machines below.



Easier and faster installation with the new Trumbull Electric Flex-A-Plug. Hanger clips hold plug in position while screws are tightened to anchor it firmly to housing. It took an electrician 12 min. to install the old type plug, as opposed to 3 min. for the new plug.

Working on the same principle involved in plugging into a wall socket, the new Flex-A-Plug taps power from heavy current-carrying Trumbull FVK Flex-A-Power Busway.

Electrically, the new device features the same type of interior used in Trumbull Electric HCI Safety Switches. This interior operates on the circuit breaker principle of arc interruption. The use of grid pins, magnetic repulsion and other circuit breaker principles to interrupt arcs gives this interior a high momentary current rating, the ability to resist heavy current surges without damage.

for DOUBLE BOILER BLOW-OFF SAFETY



These EVERLASTING Duplex Boiler Blow-Off Units are assuring double safety in plants all over the country.

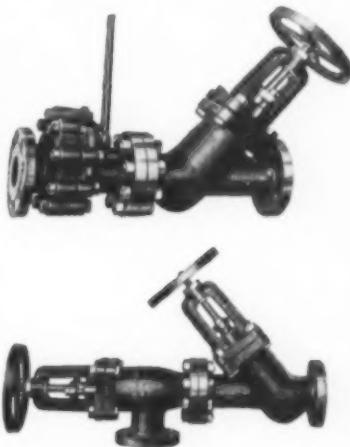
In the unit illustrated above, the left-hand valve is the standard quick-operating EVERLASTING design which opens with a quarter-turn of the lever and closes with a drop-tight seal that actually improves with use. The right-hand valve is an EVERLASTING Angle Valve, stoutly built to withstand shocks and abrasion of blow-down solids.

Below are shown two additional EVERLASTING Duplex Units, each including the EVERLASTING "Y" Valve . . . simple and sturdy in design, with all parts interchangeable with those of the Angle Valve.

All EVERLASTING boiler blow-off designs conform with ASME codes, and are available in a range of sizes for pressures up to 600 psig.

Write for descriptive bulletin.

Two of the many available
combinations of EVERLASTING
Boiler Blow-Off Units



EVERLASTING VALVE CO., 49 Fisk Street, Jersey City 5, N. J.

Everlasting Valves

TRADE MARK "EVERLASTING" REG. U. S. PAT. OFF.

FOR EVERLASTING PROTECTION

EV372

new equipment (continued)

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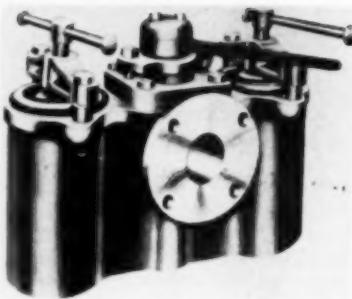
Double Basket Strainer

I-9 SHEFFLER-GROSS COMPANY, Drexel Bldg., Philadelphia 6, Pa., is now making its DuoFlo Duplex Strainers in sizes up to 12 in., and in cast iron, bronze and cast steel, for use in clearing liquids of objectionable solids.

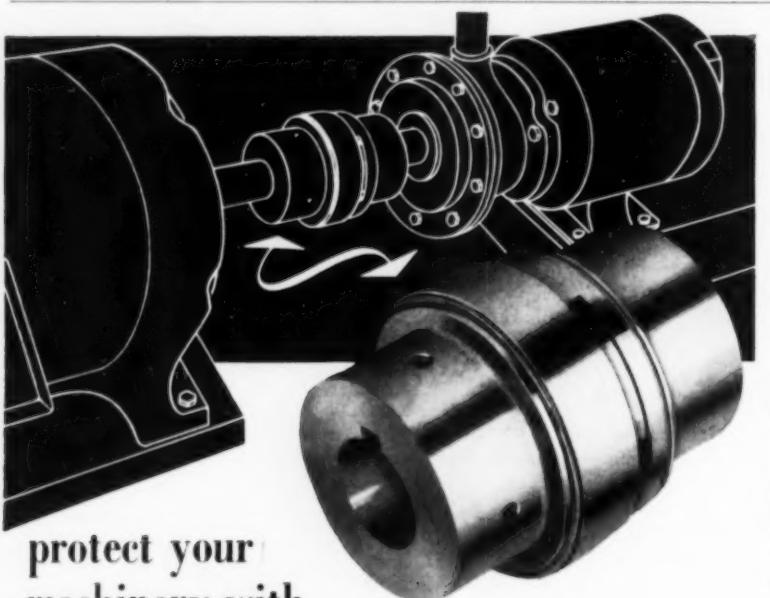
The strainers are used on either

suction or pressure liquid lines that have a continuous (non-interrupted) flow. The outstanding feature of this type of strainer is its use of two removable baskets which strain or filter foreign matter from oil or other liquid, each contained in a separate straining compartment with removable cover.

The strainer is a one-piece casting, so constructed that there is only one inlet and one outlet. A duplex three-way cone-plug valve regulates the flow so that the liquid will flow entirely through one straining basket while



Sheffler-Gross Company's DuoFlo Duplex strainers are available for working pressures up to 150, 300, 500, and 1500 psi; in sizes up to 12 in.; and in cast iron, bronze and cast steel.



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machinery with**

**maintenance-free
LOVEJOY**

FLEXIBLE COUPLINGS

When you install Lovejoy Flexible Couplings you get more than just long-lasting smooth power transmission. You get maximum protection against surge, backlash and starting torque. You get reduced down-time and less maintenance, since cushions can be changed without shutdown and Lovejoy Flexible Couplings never require lubrication.

Accurately machined bodies and jaws and cushioning materials engineered to the load conditions are combined in a compactly designed coupling to keep your machinery running better . . . longer.

TYPES AND SIZES FOR ALL APPLICATIONS!

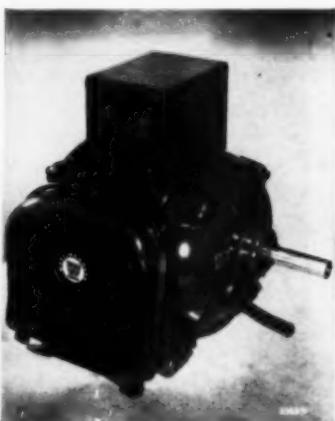
Send for complete catalog . . . contains full technical data and handy selector charts for your convenience. Yours without obligation.

Also Mfrs. of Lovejoy Variable Speed Pulleys and Universal Joints.

LOVEJOY FLEXIBLE COUPLING CO.

5011 West Lake St.

Chicago 44, Ill.



Where three-phase power is not available, the Type CAP-2 Westinghouse motor will permit the use of larger single-phase motors for air conditioning units, pumping, etc.

and their design is such that starting current is reduced about 25 per cent, with the same high starting torque. The auxiliary winding remains in the circuit during operation and is in series with the running capacitors. Relays merely remove the starting capacitors when the motor approaches full speed. The main winding is directly across the line.

Elimination of the wound rotor, brushes, and commutator of the previous repulsion-induction design makes for a simpler motor with less maintenance. It also eliminates sparking, a cause of radio interference, and a possible fire hazard.

Versatile Attachment for Grinding and Polishing

CURTIS MACHINE CORPORATION, Jamestown, N. Y., has introduced the new Curtis Adapt-A-Belt for use on a wide variety of grinding and polishing operations.

Advantages include the use of dynamically balanced rubber covered contact wheels in various diameters, widths, and durometer, as well as soft or hard cloth wheels. The Adapt-A-Belt is of rigid light weight steel construction with complete simplicity in universal attaching clamps, abrasive belt tracking mechanism with efficient belt tensioning. Grinding can be done with either end or slack belt.

One model uses abrasive belts up to 1 in. wide and weighs $2\frac{1}{4}$ lb. The other will take belts to 2 in. wide and weighs $2\frac{1}{2}$ lb.



Curtis Machine Corporation's Adapt-A-Belt is designed for use as a portable grinder attached to an air outlet or to clamp on lathes, milling machines, drill presses, or pedestal grinders to do work quickly on jobs that do not warrant setting up a machine.

Delaware Power & Light specifies

Richardson

Like many progressive utilities, Delaware Power & Light Company selected Richardson Automatic Coal Scales to maintain a constant check on boiler efficiency in their new generating station. The bank of Richardson Model 39's shown now handles this responsibility.



To both industrial and utility power generating stations,
specifying Richardson means—

- ① A 24" x 24" inlet opening and 26" wide belt for maximum coal flowability.
- ② All wiring and controls outside coal chamber.
- ③ Access doors which will not spill dust on floor when opened.
- ④ Beam ratio test facilities outside coal chamber.
- ⑤ Gravity operated by-pass, with no restriction of coal flow to downspout.
- ⑥ No drag links or wires attached to weigh hopper.
- ⑦ Nationwide after-delivery service.

Latest development in the 39 Series of Richardson Automatic Coal Scales is the Model H-39 shown below. May we send you our new 16-page engineering data book on the H-39 Coal Scale (Bulletin 0352), without cost or obligation?



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Minneapolis • New York • Omaha • Philadelphia • Pittsburgh
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Richardson
MATERIALS HANDLING BY WEIGHT SINCE 1902

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Enco

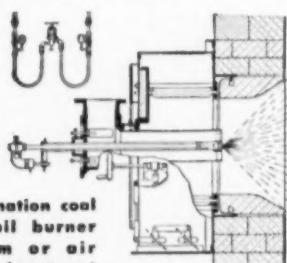
OIL BURNERS

have these
7 ADVANTAGES
in pulverized coal
fired boilers . . .

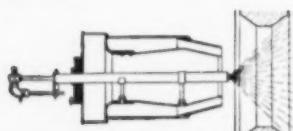
They may be installed in practically all types of pulverized coal burners, with these seven important advantages:

- They warm up cold furnaces
- They ignite pulverized coal—safely
- They assure continuous operation in case coal system fails
- They provide efficient and safe operation on bank and at low loads
- They respond almost instantly to sudden load changes
- They permit operation with oil or coal—which ever is available and lowest in cost per BTU.
- All capacities of steam, air or mechanical-atomizing types are interchangeable

The foregoing are only a few of the reasons why Enco oil-burners have been bought by a long list of leading industrial firms. Details of how Enco oil-burners can be adapted to your present pulverized coal burners will be gladly supplied—without obligation. Write The Engineer Company, 25 West St., New York, N. Y.



Combination coal
and oil burner
(Steam or air
atomizing type)



Combination coal and oil burner (Mechanical atomizing type)

Enco Burners

new equipment (continued)

For more data circle item code number
on the postage free post card—p. 17

Instrument Ink Feed

I-12 JOHN P. SQUIER CO., P. O. Box 6100, Dallas, Texas, has introduced a new light weight plastic Squier Everite Instrument Ink Feed for meter recording.

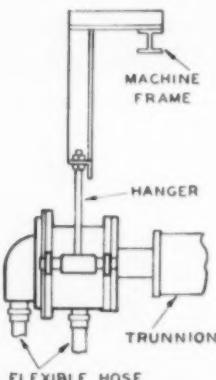
The device can be attached with plastic bands to all makes of instrument pens. No special brackets or pen arm alterations are required.

The ink feed operates on the principle of capillary action. Ink flows first upward, then down to the recording point, so sediment never clogs it. It uses regular meter ink and holds 8 days supply.

Rotary Pressure Joints

I-13 JOHNSON CORPORATION, Three Rivers, Mich., announces availability of the Type "L" Rotary Pressure Joints in all sizes of the standard Johnson Joint.

The rotary pressure joints are used for the introduction of steam or other liquids under pressure into rotating machine parts. They have found wide application in the paper, textile, rubber and plastics industries.



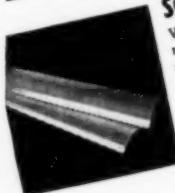
The Johnson Corporation Joint can be supported by adjustable hangers suspending the joint from the machine frame. Note how hangers hold rods inserted in the lugs of the joint.

The Type "L" is a modification of the standard joint especially developed to facilitate the proper mounting so important to proper joint operation. It is built with lugs cast on the body to permit use of simple rods to support the joint. By this arrangement, the weight of the joint proper and its steam and condensate connections is removed from the all important sealing mechanism. The entire assembly is "floated" within the housing.

MEMO:

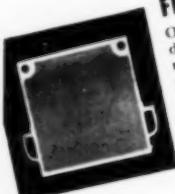
specify Cambridge
wire cloth parts
for-

SCREENING



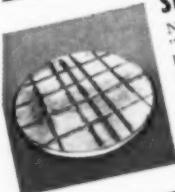
We can produce original or replacement screens in practically any size or shape, from any type of wire cloth . . . and in small or large quantities. We'll be glad to quote on your needs.

FILTERING



Our designers and production men are familiar with practically all types of filter presses, thus can design and fabricate wire cloth filter leaves for vertical or horizontal models, whether pressure or gravity fed.

SPECIAL USES



Non-standard parts are "standard" with Cambridge. We can work from your prints, or our Engineering Department will draw up prints for your approval on specially designed assemblies.

Here's the full story, FREE

... 84-page catalog describes Cambridge facilities for fabricating wire cloth parts. Also contains useful metallurgical data. Write for your copy today.



The Cambridge Wire Cloth Co.

Dept. Y • Cambridge 9, Md.



WIRE CLOTH METAL & MESH
BELTS CONVEYOR SPECIAL
METAL FABRICATIONS

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

See "Wire Cloth" in your classified phone book.

Electric Drill

I-14 THE EMERSON ELECTRIC MFG. CO., United States Electrical Tool Division, 8130 Florissant Ave., St. Louis 21, Mo., announces a popular priced $\frac{1}{4}$ in. full ball bearing drill.



Built for continuous duty, the drill features strong aluminum alloy frame, heat treated alloy steel gear, jacob's 3-jaw geared chuck and powerful universal motor. No-load speed is 2500 rpm.

Indoor Insecticide Unit

I-15 TODD SHIPYARDS CORPORATION, Combustion Equipment Div., 81-16 45th Ave., Elmhurst, N. Y., has announced a new, portable, electrically-driven insecticidal fog applicator especially designed for indoor use.

The new unit was designed to meet the demand for compact, easy-to-move insecticide dispensers that would create no fire hazards for indoor uses. It runs on any 110 volt a-c outlet.

The list of possible industrial applications includes carpet factories, textile and paper mills, food packing plants, canning factories, frozen food plants, feed storage plants, flour mills, and bottling plants.



The Todd electrically driven insecticidal fog applicator converts liquid solutions of prescribed insecticides, weedkillers or fungicides in oil or other solvents into a fog-like emission.

BELMONT

PACKINGS

for WATER...STEAM...OIL...



BELMONT 9 . . . for all hydraulic services from low pressures to extremely heavy duty, hot and cold water.

BELMONT 19 . . . for hot and cold water rods and plungers; low and intermediate steam rods.

BELMONT 30 . . . for high pressure steam rods, expansion joints, air, and gas.

for better sealing—LONGER

Regardless of the temperatures or pressures involved . . . no matter what the lading . . . your equipment maintenance costs can benefit from longer, more dependable packing life. If you're paying for the best—and you probably are—make sure you get it by specifying BELMONT Packings in formulations suited to your particular needs.

Don't make do with the next best—insist on BELMONT . . . available in a wide range of materials . . . hundreds of styles and types . . . through distributors everywhere.

For technical assistance on packing specifications, write direct—ask for Catalog #40 or detail your particular problems.

4 M-1

THE **BELMONT**
PACKING and RUBBER CO.
Butler and Sepviva Streets
Philadelphia 37, Pa.

FOR STEAM • WATER • OIL • GAS
SIR • ACIDS • ALKALIES • AMMONIA

BELMONT INCORPORATED
PHILADELPHIA U.S.A.

RINGS • SPIRALS • COILS • RIBS
SPROPS • SHEETS • GASKETS

THERE'S A BELMONT PACKING FOR EVERY SERVICE

**One Operator Does
the work of two
when Bellows
"Controlled-Air-Power"
goes on the job**



Bellows "Controlled-Air-Power" automatically drills four holes, indexes the jig, drills four more holes, returns the jig to starting position for unloading. Drilling production increased 100%! And the operator has enough "off time" to perform an extra tapping operation by hand.

Foto Facts File FF-47-414.

Almost any manually fed machine tool can turn out twice as much work when helped by Bellows pneumatic feeding and holding devices



Yes, you can double, even triple, production from such standard machine tools as drill presses, milling machines, etc., when Bellows "Controlled-Air-Power" is installed to feed the tool or work piece, and clamp the part in position.

Not only is production increased, machining quality is better, rejects fewer. Tools hold their cutting edge longer, and the problem of excessive worker fatigue is a thing of the past.

**Write for this
convincing
EVIDENCE**



The Foto Facts File. Case history stories showing "Controlled-Air-Power" at work in large and small plants, in all lines in industry. Photographs, production and cost data.

WRITE TODAY. DEPT. SPI-953

The Bellows Co. Akron 9, Ohio

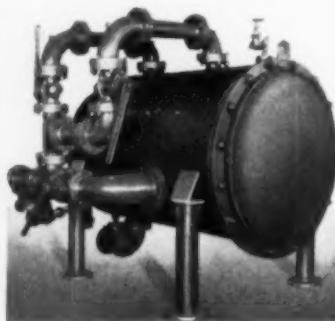
Manufacturers of "Controlled-Air-Power" Devices: Air Motors, Air Cylinders, Air-Powered Tool and Work Feeding Devices, Air-Operated Work Holding and Clamping Units.

new equipment (continued)

For more data circle item code number
on the postage free post card—p. 17

Plant Water Filter

I-16 SPARKLER MANUFACTURING Co., Mundelein, Ill., has introduced a new type filter employing diatomite filtering for plant water.



Sparkler filters are available in sizes from 25 sq ft to 1000 sq ft of filtering surface.

The manufacturer states that now, the fine uniform filtering obtained with a surface type diatomite filter can be used for large volume water filtering with complete success. This filter will completely remove suspended matter either colloidal or solid, bacteria 80% to 100% depending on the type of bacteria and the grade of diatomite used, thus reducing the required chlorination to a very low point.

With this filter it is practical to use raw water sources such as lakes, rivers, wells, etc., for industrial plant water supply with safety.

Respirator

I-17 MINE SAFETY APPLIANCES COMPANY, Braddock, Thomas & Meade Sts., Pittsburgh 8, Pa., has announced a new dust respirator designed to pro-

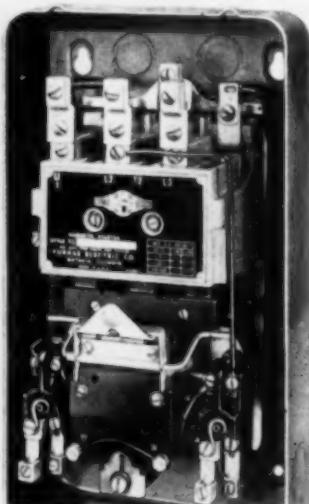


vide the highest degree of user comfort.

The new respirator, called the Dustfoe No. 55, weighs only 2 1/4 oz., 25 per cent less than previous models. Breathing resistance has been cut in half, and a 50 per cent reduction in width of the filter holder eliminates a "blind-spot" area and greatly increases the downward vision.

Magnetic Starter

I-18 FURNAS ELECTRIC COMPANY, 1047 McKee St., Batavia, Ill., has introduced a new "size 2 1/2" magnetic starter and contactor series.



Furnas Electric's style YG Magnetic Starter is rated 20 hp at 208-220 volt; 30 hp at 440-550 volt a-c polyphase. Some available with built-in push-button or selector switch.

Because the horsepower rating overlaps the size 2, many applications heretofore requiring the purchase of a size 3 control can now use the 2 1/2, thereby saving considerable cost. The smaller physical size is also an advantage.

Double Shut-off Fog Nozzle

I-19 AKRON BRASS MFG. CO., Wooster, Ohio, announces a new low-cost fog nozzle, developed especially for aiding plant personnel and fire departments in fighting industrial fires.

Recommended for use with all industrial hose and hose racks, this fog nozzle opens from a shut-off position immediately to a 160 degree full fog position. This vapor prevents disastrous water damage to plant equipment and inventory caused by a heavy



The Akron Industrial fog nozzle, made for 1½ in. hose, operating in fog position. Nozzle has a double shut-off since water stream can be stopped by turning the nozzle to either extreme right or left.

solid stream of water; precludes the spreading of liquid fire and disperses poisonous fumes, gases and smoke as well as inflammable vapor air mixtures. This unusually wide, intense curtain of water also smothers the fire quickly, cooling it below the burning point; forms a wide protective shield that guards the fire fighter against the heat and fire and stops the fire from flashing back over previously extinguished areas.

Water Treatment

(Starts on page 86)

waste and permitting some settlement and aeration, experience with full plant operation under varying stream flow conditions will indicate whether additional effluent treatment is needed to maintain stream pollution within acceptable limits.

Power Supply

Power amounting to 2,300 kw demand for the operation of the Sevier plant will be furnished by Duke Power Co., who have erected a nine-mile transmission line from the Marion, N. C., substation. The primary voltage of 44,000 volts will be transformed to 550 volts at the plant substation erected outside the switchgear room, which is centrally located to permit economical installation and maintenance of power distribution feeders to load centers. Three transformers are in constant use and one is reserved as a spare.

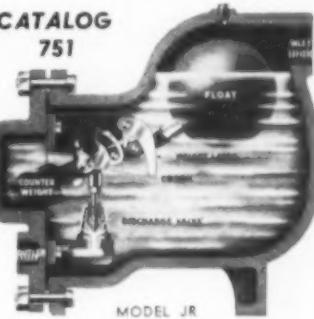
Solve Sludge Problem with Nicholson's *New AIR TRAPS*

With the introduction of an exclusive new oil-eliminating feature, Nicholson air traps now enable you to enjoy the advantages of the positive intermittent action of a float-operated air trap without the common problem of oil congealing on the mechanism and impeding or stopping its action. Other features of Nicholson air traps:

- 1) No air-wasting vent, such as is in all inverted bucket traps.
- 2) Positive water seal of valve.
- 3) Large orifice keeps valve clean, preventing blow-through.

Three types; pressures to 1500 lbs. These weight-operated traps also for steam.

CATALOG 751



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W. H. NICHOLSON & CO.
TRAPS · VALVES · FLOATS

EXTRA YEARS

OF MORE DEPENDABLE POWER
and at less cost per pound of steam

TODD BURNERS

GAS OR OIL

COMBUSTION EQUIPMENT DIVISION
TODD SHIPYARDS CORPORATION

81-16 45th Avenue

Elmhurst, Queens, N. Y.



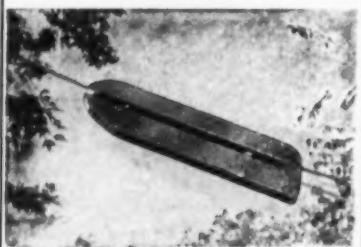
MARTINDALE

COMMSTONE HOLDER



Holds Commstones rigid and true for concentric resurfacing of commutators and slip rings while running at normal speeds in their own bearings. Grinds commutators $4\frac{1}{2}$ to $4\frac{3}{4}$ " wide. Used with two Commstones in stone holder or one Commstone in 2" box.

WIRE CREEPER



A new, speedy method of stringing additional overhead wires over houses, through trees, across congested areas, etc., by means of a remote controlled creeper that carries cord from one pole to next on available wire.

MICA-MILLER



A powerful, light weight, low cost, easy to use Undercutter, operating from 1/5 h.p. Universal motor. Available with small, medium or heavy duty head (interchangeable). Also available with air motor, or flexible shaft drive.

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WHAT'S NEW and Where to Get It

Free literature on the latest developments in equipment and supplies is offered by leading manufacturers. For your copy, circle the item number on one of the reader service post cards provided on pages 17 and 18.

U-1 HARDSURFACING — Weldirectory 466, 29 pages—General discussion of Arc Weld Surfacing, with new chart or hardsurfacing guide. Contains new material on hardsurfacing fluxes. Photographs show typical applications in industrial plants.—THE LINCOLN ELECTRIC COMPANY, 22801 St. Clair Ave., Cleveland 17, Ohio.

U-2 INDUSTRIAL STRAINERS—Bulletin 260, 8 pages—Illustrates and describes different types of Duoflo Duplex Strainers and strainer baskets, for use in clearing liquids of objectionable solids. Diagrams, tables of dimensions, recommended openings in baskets, and other engineering data are included.—THE SHEFFLER-GROSS COMPANY, Philadelphia 6, Pa.

U-3 OIL BURNERS—Condensed Catalog, 16 pages—Lists oil and combination gas-oil burners, including: fully automatic, semi-automatic and manually controlled horizontal rotary and steam turbine drive burners; gives specifications and capacities.—RAY OIL BURNER CO., 1301 San Jose Ave., San Francisco 12, Calif.

U-4 LUBRICATORS—Catalog 25G, 12 pages—Illustrates and describes new high pressure force feed lubricators designed for service at up to 30,000 lbs. for use in chemical companies and other plant operations. Dimensions, specifications, and ordering information are included. Photographs show types available.—MANZEL DIVISION of Frontier Industries, Inc., 315 Babcock St., Buffalo 10, N. Y.

U-5 CAR HANDLING—Bulletin T-112, 8 pages—Improved operational features of Trackmobile Model 2TM and how they help users achieve lower cost freight car handling, are presented. Industrial applications of this gasoline powered switcher are illustrated, and complete specifications, performance and dimension tables are included.—WHITING CORPORATION, Harvey, Ill.

U-6 AIR HOSE—Bulletin, 4 pages—Describes different uses for line of air hose, from heavy duty construction to light industrial applications. Includes cross section and cutaway photographs, performance data, sizes, weights, and working pressures. Covers types of couplings best suited for specific hose.—QUAKER RUBBER CORPORATION, Division of H. K. Porter Company, Inc., Tacony & Comly Sts., Philadelphia 24, Pa.

U-7 STEAM GENERATORS—Catalog No. G.B.-153, 29 pages—Illustrates various designs and typical installations of Union steam generating units and allied equipment. Line drawings and charts give engineering data.—UNION IRON WORKS, Erie, Pa.

U-8 CHAIN AND SPROCKETS—Bulletin A-624, 24 pages—Gives data required to select, specify, or buy roller chain and sprockets. Includes cross section drawings, dimensions, number of teeth, list prices with and without bushings, sprocket number, bushing number, and other pertinent information. Illustrated.—DODGE MANUFACTURING CORPORATION, Mishawaka, Ind.

U-9 BEARINGS—Catalog No. 152, 66 pages—Contains complete listings of industrial standard stock bearings, bars and electric motor bearings. Items are illustrated. Pocket size, but contains all bronze bearing information that appears in the company's larger catalog.—THE BUNTING BRASS & BRONZE COMPANY, 715-755 Spencer St., Toledo 4, Ohio.

U-10 MATERIALS HANDLING—Bulletin 1344, 6 pages—Describes and illustrates the "Gas-O-Matic" fork lift truck. Baker's unique electric-transmission truck which uses no clutch, transmission, controller or resistors. Explains principle of design and operation. Emphasizes savings in fuel and maintenance.—THE BAKER-RAULANG COMPANY, Baker Industrial Truck Division, 1230 West 80th St., Cleveland 2, Ohio.

U-11 HANDLING OF BARRELS—Booklet, "The Logistics of Barrels," 8 pages—Discusses methods of handling barrels and barrel shaped objects by power industrial trucks, in manufacturing, processing, assembling, and warehousing. Gives suggestions for planning flow of goods and obtaining more effective storage practices.—ELWELL-PARKER ELECTRIC CO., 4265 St. Clair Ave., Cleveland 3, Ohio.

U-12 ELECTRICAL FITTINGS—Catalog 53, 16 pages—Describes complete line of solderless wire connectors and specialized electrical fittings. Contains application photographs, specifications, dimensional data, instructions, and ordering information.—BUCHANAN ELECTRICAL PRODUCTS CORPORATION, Hillside, N. J.

U-13 GEAR PUMPS—Bulletin 17-A, 24 pages—Describes all standard pumps, and some of the special types engineered to meet unusual requirements. Design, construction, and operation are discussed, as well as application in many industrial fields; information for selection is included.—SHUTTE AND KOERTZING COMPANY, Dept. P-E, Cornwell Heights, Bucks County, Pa.

U-14 WATER-TUBE STEAM GENERATOR—Booklet, "Type A," 8 pages—Contains data and specifications for completely factory assembled units in 9 sizes, ranging from 5,300 to 33,000 lb steam per hr, for pressures up to 400 psi, designed to provide fully automatic firing with oil, gas, or stoker-fired coal. Illustrated.—SUPERIOR COMBUSTION INDUSTRIES, INC., Dept. W, 1475 Broadway, New York 36, N. Y.

U-15 MACHINE SHOP UNIT—Catalog U.R. 118, 8 pages—Describes basic machine designed to carry out a wide variety of operations including cylindrical grinding; tool and cutter grinding; surface grinding; internal grinding; disc grinding, vertical milling; horizontal milling; boring and drilling; slotting; disc filing; band sawing; and numerous other plant operations.—NEWAGE INTERNATIONAL, INC., 235 East 42nd St., New York 17, N. Y.

U-16 CORROSION PROTECTION—Publication B-36R, 28 pages—"Corrosion Resistance of Copper and Copper Alloys" explains the chemical and physical nature of corrosive attack in its various forms. Includes tabulation indicating relative corrosion resistance of principal types of copper and copper base alloys in contact with corroding agents.—THE AMERICAN BRASS COMPANY, Waterbury 20, Conn.

U-17 PLANT HEATING—Bulletin No. 560-61, 4 pages—Illustrates new "heat curtain" designed to solve the problem of cold air intruding through open doors. Gives case history of two combination oil and gas fired space heaters equipped with ductwork to heat a plant.—DRAVO CORPORATION, Heating Dept., Dravo Bldg., Pittsburgh 22, Pa.

Dow Power—Texas

(Starts on page 56)

phone equipment and a public address system has been included.

Operation and Costs

This plant will be operated with a 6-man shift. This has been demonstrated conclusively during the past few months with two boilers and two turbo-generator units operating. The normal load on the station will be 150,000 kw, 700,000 lb/hr of extraction steam at various pressures and 2000 cfm of compressed air.

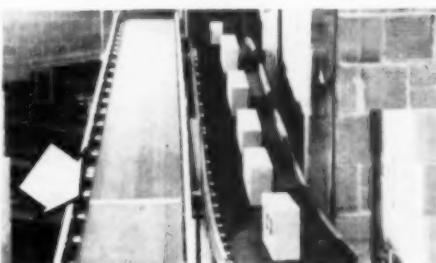
The normal station heat rate will be approximately 10,500 Btu, with credit for extracted steam which goes to process. This compares favorably with the best utility practice, although we have very little regenerative cycle equipment.

The cost of this station will be \$156/kw. If this might be compared on a hypothetical basis with a normal utility plant of the same capability, built on the same site or, in other words, eliminating all equipment which would not normally be required in a utility plant and adding those items which would be required, the cost would be \$108/kw, all cost figures based on capability. This shows that a large industrial plant has invested approximately \$48/kw in order to attain certain extra objectives such as large quantities of extraction steam, flexibility, continuity of operation and the type power distribution facilities associated with an industry where the basic load is power for electrolytic processes.

REFERENCES

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3. "Power for Dow Texas Plant," by J. S. Rush and W. S. Jennings. *S. P. & I.*—February, 1945
4. "Engineering of Power Plants for Process Industries," by A. D. Rust. *Heat Engineering*—December, 1952
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- ★ For magnetic separators or anti-sparking specify Alligator made of Everdur.
- ★ Separable and smooth on both sides.
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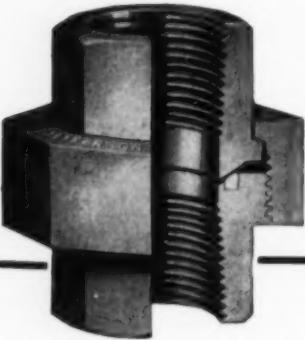


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Jefferson Unions are inherently strong. Every detail is designed for **STRENGTH**, for long carefree service and for leak-proofness without undue wrench pressure. They are a quality product throughout . . . in design, material and workmanship . . . and they cost less per year of service. Completeness of the Jefferson line in types available means simpler piping systems as well as savings in time and material.

Remember this: Jefferson Unions are made of air-refined malleable iron of 55,000 p.s.i. tensile strength; uniform seat rings are of seamless drawn brass tubing and press-fitted into machined channels; seats are of true precision spherical contour.

The Jefferson line includes: WOG 2000 # to 2" and 1000 # up to 4"; straight through unions, union ells and union tees; flange unions; AAR male and female unions, Enduro 300 #, Excel 250 # and Master 150 # unions. All types are also available with all-iron seats. Underwriters approved.

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PUBLISHED BY THE LINCOLN ELECTRIC
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22801 St. Clair Ave., Cleveland 17,
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1200 pages

Price, \$2.00

This Ninth Edition of the "Procedure Handbook of Arc Welding Design and Practice," an authoritative collection of data on the proper use of the arc welding process, brings up to date the developments since the Eighth Edition which was published several years ago. New techniques, new electrodes, and considerable new design information on the uses of arc welding are available. The edition has been completely revised and re-edited, for use by the designer, engineer, shop supervisor, and welding operator.

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PUBLISHED BY AMERICAN SOCIETY FOR
TESTING MATERIALS

1916 Race St., Philadelphia 3, Pa.

344 pages

Price, \$4.25

The book offers information to plant managers, designers, and technologists on the influence of water on industries in which it is used either as a raw material or in conjunction with manufacturing processes. Chapters include: Uses of Industrial Water; Difficulties Caused by Water in Industry; Composition of Industrial Water and Water-Formed Deposits; Treatment of Industrial Water; Sampling of Industrial Water; Analysis of Industrial Water; Sampling and Identification of Water-Formed Deposits; and Analysis of Water-Formed Deposits.

Power Plant Engineering

BY FREDERICK T. MORSE

PUBLISHED BY D. VAN NOSTRAND
COMPANY, INC.

250 Fourth Ave., New York 3,
N. Y.

687 pages

Price, \$8.75

This Third Edition incorporates additions, deletions, and modifications to the extent that it is more of a new book than a revision of the author's previous work, "Power Plant Engineering and Design." It presents an up-to-date, thorough study of stationary power and heating plants, includ-

ing public service, industrial, and institutional types.

Chapters cover Variable Load Problem; Power Plant Economics; The Power Plant Building; Fuels and Combustion; Internal Combustion Engine Power Plant; Gas Turbine Power Plant; Vapor Cycles; Energy Flow in the Steam Plant; Steam Generators; Steam Prime Movers; The Gas Loop; The Feedwater Loop; The Piping System; and Instrumentation.

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PUBLISHED BY THE INDUSTRIAL PRESS
148 Lafayette St., New York 13,
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This handbook, written by a pipefitter for pipefitters, is designed to provide quickly and conveniently the answers to problems involving pipe bending, layout and installation. Includes: fitting dimensions, measurements, angles, conversion factors, spacing of pipe hangers, soldering and brazing, mitering, and a dictionary of piping terms.



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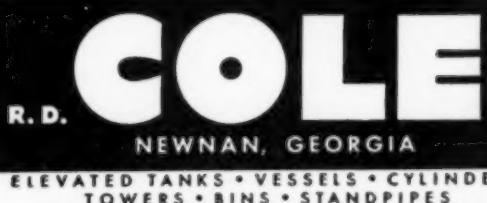
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Established 1854



FUNDAMENTALS OF BOILER PLANT ENGINEERING

(Basic Principles of Steam Plant Practice)

By A. D. HOLLAND

Assoc. Prof. of Mech. Engr., Georgia School of Technology

"Fundamentals of Boiler Plant Engineering"—is different from most handbooks in that it goes into the fundamental principles of boiler plant operation. It is written so that it can be studied by those who have not had an opportunity to learn these basic laws; at the same time its many charts, tables and formulas make it a valuable reference book for the trained engineer.

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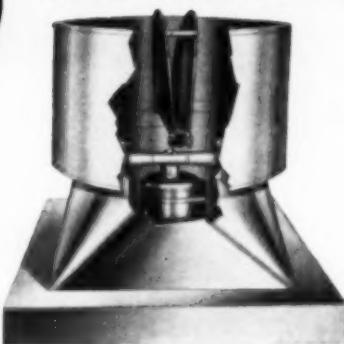


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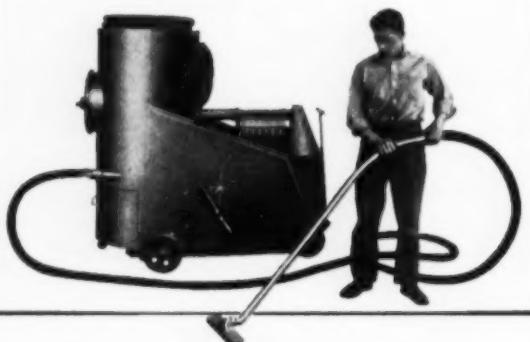
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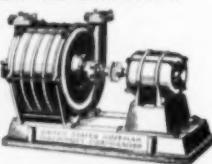
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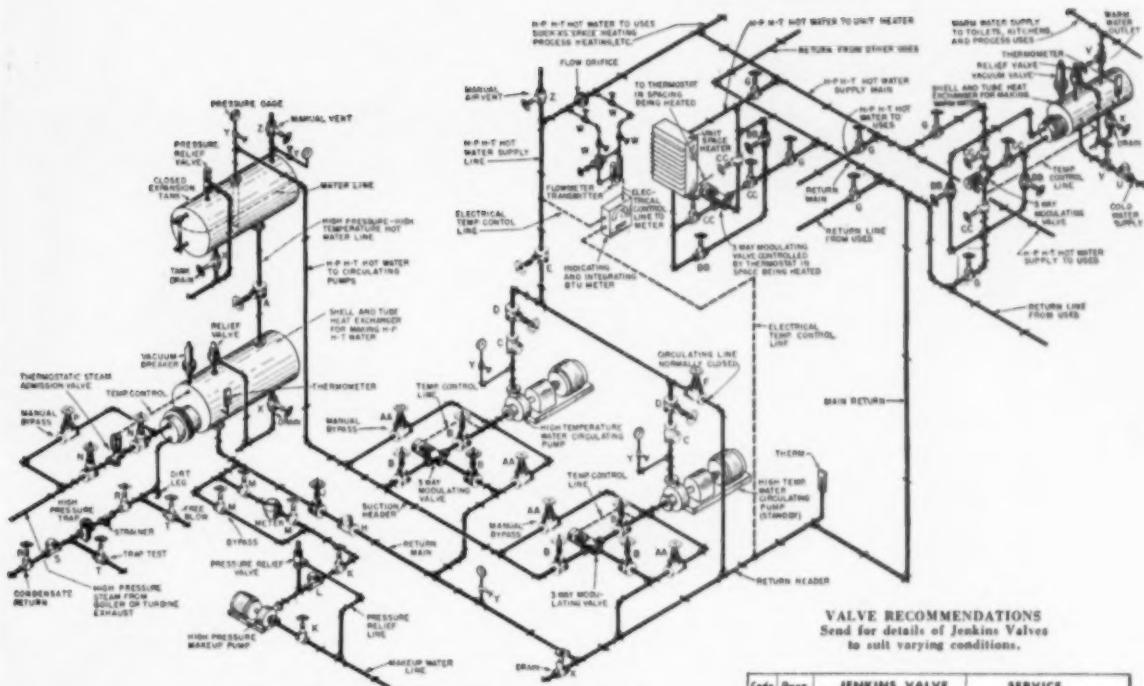


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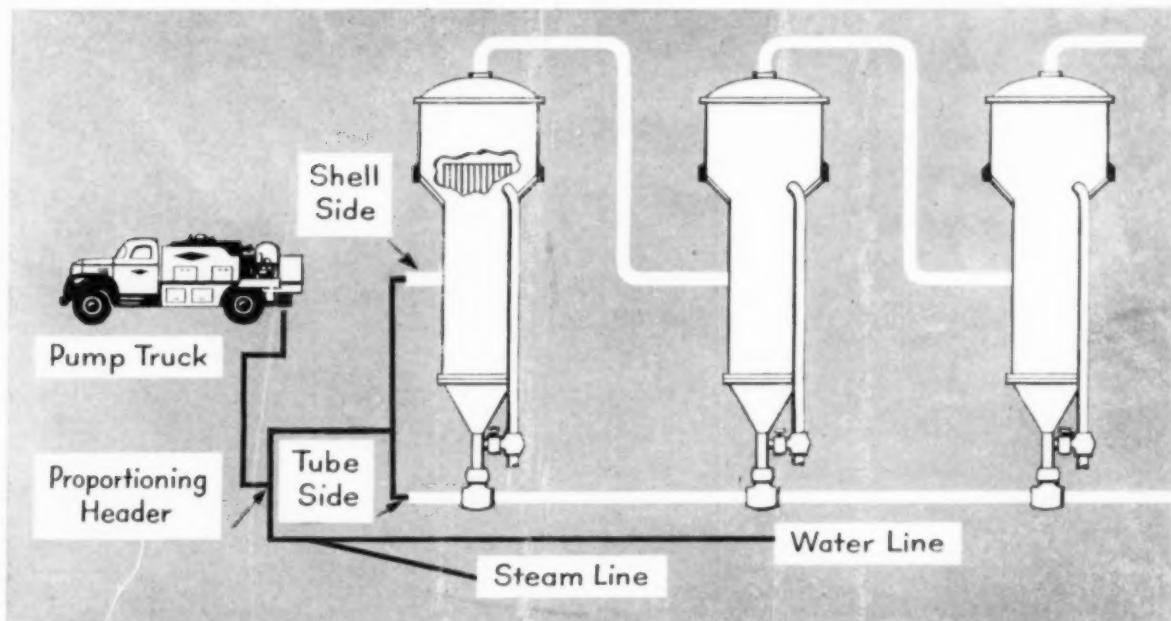
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B	6	Fig. 204 IBM Gate	3 Way Valve Shut-off
C	2	Fig. 339-B IBM Swing Check	Prevent Backflow
D	2	Fig. 204 IBM Gate	Pump Discharge Shut-off
E	1	Fig. 204 IBM Gate	Supply Line Shut-off
F	1	Fig. 23 IBM Globe	Circulating Line Shut-off
G	6	Fig. 280 Bronze Gate	Branch Shut-off
H	1	Fig. 339-B IBM Swing Check	Prevent Backflow
J	1	Fig. 204 IBM Gate	Return Main Shut-off
K	2	Fig. 280-U Bronze Gate	Makeup Pump Shut-off
L	1	Fig. 962 Bronze Swing Check	Prevent Backflow
M	3	Fig. 280 Bronze Gate	Makeup Meter Shut-off
N	2	Fig. 1010 Cast Steel Gate	Thermostatic Valve Shut-off
P	1	Fig. 1042 Cast Steel Globe	Thermostatic Valve Bypass
R	2	Fig. 250-UN Bronze Gate	Condensate Line Shut-off
S	1	Fig. 976 Bronze Swing Check	Prevent Condensate Backflow
T	2	Fig. 976-A Bronze Globe	Trap Test, Free Blow
U	1	Fig. 352 Bronze Swing Check	Prevent Backflow
V	2	Fig. 47-U Bronze Gate	Cold Water Shut-off
W	4	Fig. 703 Bronze Globe	Flow Meter Pressure Taps
X	4	Fig. 976-A Bronze Globe	Drain Lines
Y	5	Fig. 703 Bronze Globe	Pressure Gage Control
Z	2	Fig. 976-A Bronze Globe	Air Vents
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BB	4	Fig. 976-A Bronze Globe	3 Way Valve Bypass
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